

1914-1915

FIRST ANNUAL REPORT
OF THE
FIRE PREVENTION COMMISSIONER
FOR THE METROPOLITAN DISTRICT,
MASSACHUSETTS.

FROM AUGUST 1, 1914, TO AUGUST 1, 1915.



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The Commonwealth of Massachusetts.

TO HIS EXCELLENCY DAVID I. WALSH, *Governor of the Commonwealth of Massachusetts.*

SIR: — The Fire Prevention Commissioner for the Metropolitan District herewith respectfully submits his first annual report. The work of the department has covered less than a year; the active work of the department has covered very much less than a year. The Commissioner's appointment was confirmed Sept. 16, 1914; the Deputy Commissioner was appointed Oct. 21, and the Secretary, November 7.

Respectfully submitted,

JOHN A. O'KEEFE,

*Fire Prevention Commissioner
for the Metropolitan District.*

REPORT.

EVENTS LEADING TO FIRE PREVENTION STATUTE.

The excessive fire loss in Boston and adjoining cities and towns had for many years been a matter of serious consideration. For ten years the per capita property loss by fire in the city of Boston had averaged \$3.56; while in Austria, Denmark, France, Germany, Italy and Switzerland taken together it had averaged 33 cents. Thoughtful men had commenced to look for the remedy. On the twenty-fifth day of August, 1910, the Boston Chamber of Commerce appointed a committee consisting of six of its members to prepare and submit to the Board of Directors of that body a report on conditions in Boston "relating to fire hazard and losses, with recommendations as to the best method to follow in improving these conditions." That committee included Clarence H. Blackall, who was chosen chairman, Edward D. Densmore, John B. Graham, Patrick A. O'Connell, Leslie C. Wead and Robert S. Coffin. After a study of the subject, the committee reported to the Chamber of Commerce in September, 1911. This report is an interesting and valuable document. It calls attention to the excessive fire loss in the United States, notes the causes, and makes the following recommendations:—

To reduce the construction hazard: (*a*) the enactment of city ordinances which shall prohibit the construction of any third-class building within the city limits; (*b*) the enactment of a law prohibiting the construction of any but fireproof buildings within the congested business district of the city; (*c*) the passage of a law requiring all second or third-class buildings now existing within the congested business district of the city to be equipped with sprinkler service, except that houses for habitation, not used in any portion for any other purpose, need not be so equipped, and that hotels and lodging houses need be

so equipped only in the basement, first story, and public halls, dining rooms or assembly rooms.

To prevent carelessness or deliberate mismanagement: (a) the passage of a law creating a fire bureau empowered to examine into every fire, and make a published report thereon, giving in detail the cause of the fire and locating the exact responsibility in much the same manner as the coroner's jury investigates a crime; (b) the passage of a law regulating the issuance of fire insurance covering any building previous to approval by formal act of said fire bureau.

To improve the efficiency of the fire-fighting systems: (a) the installation of a high pressure fire service carried through the streets of the congested portion of the city; (b) doing away as rapidly as conditions will permit with the obsolete and cumbersome system of portable engines and machinery operated by horses, and the substitution of self-propelled fire apparatus.

In 1912 the subject was brought before the General Court, and its consideration resulted in chapter 103 of the resolves of that year, which provided as follows:—

RESOLVE TO PROVIDE FOR AN INVESTIGATION OF LOSSES OF LIFE AND PROPERTY BY FIRE IN THE METROPOLITAN DISTRICT.

Resolved, That the governor, with the advice and consent of the council, shall, within sixty days after the passage of this resolve, appoint a commission of five persons, citizens of the commonwealth, to investigate the loss of life and property by fire, the causes of fires, the improvements in means for their prevention, and the fire hazard in the metropolitan district as defined by section three of chapter four hundred and seven of the acts of the year eighteen hundred and ninety-three. Of the said commissioners, one member shall be the fire commissioner of the city of Boston, one member shall be an architect, one a builder, one a person skilled in the insurance business, and one a person familiar with the business of dealing in or managing real estate. The members of the commission shall serve without compensation, but may incur such expenses in the performance of their duties, not exceeding the amount of twenty-five hundred dollars, as may be authorized by the governor and council. The commission shall report to the general court, on or before the first Wednesday of January in the year nineteen hundred and thirteen, with recommendations concerning legislation for the prevention of fires and loss of life and property by fires, and with such other recommendations concerning the subject of the fire hazard in the metropolitan district as it may deem proper.

Acting under the authority given in this resolve the Governor named the following committee: Francis R. Bangs, chairman, Francis G. Powell, Patrick O'Hearn, Charles H. Cole and Henry M. Fenton. This committee made an exhaustive study of the problem, and in the early part of 1913 filed a report containing many suggestions and a proposed fire prevention statute. Nothing was done by the General Court during that session, but in the following year it passed the present fire prevention statute which is set forth in Appendix I.

THE FIRE PREVENTION STATUTE.

The Massachusetts fire prevention statute seeks to create an official whose constant duty it shall be to prevent loss of life and of property by fire; through him it aims to obtain uniform laws and ordinances, and most important of all, uniform law enforcement throughout the Metropolitan District; and in addition it seeks to secure these advantages at a minimum of cost, not by creating a large corps of inspectors or officials for the department, but by giving the Commissioner power to make his investigations and enforce his orders through agencies already existing in the twenty-six cities and towns of the Metropolitan District. It can most profitably be considered from three points of view: (1) the powers conferred on the Commissioner; (2) the provisions made for the actual administration of those powers; and (3) the remarkable extent to which the statute is modified by the desire to safeguard life.

All powers existing in any officers, councils, bodies, boards or persons other than the General Court and the judicial courts of the Commonwealth, for the inspection, regulation or restraint of trade in inflammable fluids and explosives, are vested in the Commissioner. Paint stores, paint shops and carpenter shops — indeed any place “where materials are kept or handled that may be dangerous to the public safety as a fire menace” — must have a permit from him, if located within 50 feet of a dwelling house. Among such materials the statute mentions feed, hay, straw, excelsior, shavings, sawdust, cotton, paper stock, feathers or rags. To these the Commissioner, under the authority of the general language given above, has added red-hot iron, and the glowing charcoal and sparks of a forge, where

a blacksmith shop is located in a tenement house. Of course he is given the power to order the removal of rubbish.

A far-reaching jurisdiction given him is the right to order the installation of automatic sprinklers. This authority is limited, but the limitation is not such as to prevent him from reaching most of the dangerous buildings in a great city. He cannot order automatic sprinklers in any building unless there is a hazardous occupancy, with at least four persons living or working above the second floor. Practically, he is able to obtain automatic sprinklers in any building containing a hazardous occupancy that is situated within 50 feet of a dwelling house.

Section 13, in subdivisions A to M, states the number of particular powers conferred on the Commissioner. At this time mention will be made of only two:—

(1) Subdivision E, which gives to the Commissioner full power to enforce any statute or any city ordinance or town by-law in respect to fires and the prevention of fires. The importance of this section cannot well be overestimated. Many cities and towns have wise and effective ordinances or by-laws for the prevention of fire that are not enforced. The Commissioner is able to put life into these neglected ordinances and by-laws, and to realize for the community the benefits they were intended to bring about. The following notice recently published in Lynn papers illustrates the method pursued:—

THE COMMONWEALTH OF MASSACHUSETTS.

NOTICE.

FIRE PREVENTION COMMISSIONER.

The attention of residents of the city of Lynn is called to section 97 of the city ordinances which provides as follows:—

No building of which any part is used for storage or sale of hay, straw, hemp, flax, shavings, burning-fluids, turpentine, camphene, or any inflammable oil, or other highly combustible substance, shall be occupied in any part as a dwelling, tenement or lodging house; except that rooms for coachmen or grooms may be allowed in connection with the private stables authorized by this act, by permission of the inspector.

All receptacles for ashes in any building shall be enclosed with incombustible material satisfactory to the inspector. Ashes shall not be allowed to be placed in any combustible receptacle within the fire limits, or in any public building, manufactory, workshop, tenement or lodging house without the fire limits.

Notice is hereby given that it is the intention of the Fire Prevention Commissioner, on and after Aug. 1, 1915, to require the enforcement of said ordinance.

JOHN A. O'KEEFE,

Fire Prevention Commissioner for the Metropolitan District.

(2) Subdivision M apparently is without significance. The Attorney-General has decided that it does not extend the authority to order the installation of sprinklers contained in sections 10 and 11.

It has been said above that the executive part of the Commissioner's work, the investigations required, and the enforcement of his orders and rules, must be done through agencies already existing in the cities and towns of the district, — in the words of the statute, "The head of the fire department or any other designated officer in any city or town in the metropolitan district." To insure the Commissioner reasonable assistance from such designated officers, section 16 provides a fine not exceeding \$1,000 for any city or town that refuses, or unreasonably neglects, to obey any lawful order, rule or regulation of the Commissioner, and a fine of \$50 for the official. Section 2 authorizes the Commissioner to "employ such clerks, stenographers, and office employees, engineering and legal assistance, as he may deem necessary." But it has been decided by the Attorney-General that this language does not cover inspectors. The statute provides that the Deputy Commissioner "shall perform such inspections or other duties as the Commissioner may direct," and the present efficient Deputy Commissioner has been of great assistance in making special investigations, and in visiting the heads of fire departments in the various cities and towns, to advise them on the method of dealing with difficult local situations, or on the application of the law. The Commissioner in addition has visited each city and town to familiarize himself with its special condition, or to confer with the local officials, and the secretary has had charge of such scientific tests as were required. Outside of this, the office of the Fire Prevention Commissioner has been a center, to which objectionable or dangerous conditions have been reported, where they have been considered and whence remedial orders have issued.

The desire to safeguard life stands out clear in the Massachusetts fire prevention statute. Loss of life by fire usually falls on the wage earners, and the wage earners of Boston played a very important part in the adoption of the statute. The resolve of 1912 had been entitled a "Resolve to provide for an investigation of losses of life and property, etc." It will be noted that the word "life" preceded the word "property," indicating the predominate idea in Massachusetts' fire prevention.

Section 6 of the statute places the keeping and storing of paints and oils under serious restrictions, if the business be carried on within 50 feet of any building used for dwelling purposes. Section 7 requires that the keeping and handling of "any article that may be dangerous to the public safety as a fire menace" must have the Commissioner's permit if carried on within 50 feet of a building used for habitation. Section 13, subdivision G, invests the Commissioner with power to "require and regulate fire drills in theatres, public places of amusement, and public and private schools."

Finally, and perhaps most striking of all, the Commissioner's authority to order automatic sprinklers depends on the requirement that at least four persons live or are usually employed above the second floor. This solicitude for life is in keeping with the attitude Massachusetts has taken towards industrial development, and at the very start commended statutory fire prevention to the wage earners.

POLICY OF DEPARTMENT.

The Fire Prevention Commissioner had to do his work without inspectors. This perhaps more than anything else forced him to consider fire prevention as a psychological problem. He must so present facts and motives as to influence men's minds in favor of his work. He must get men generally to do the work for him, by appealing to some motive in them that will tend to control their actions. This has been the policy of the department.

In the first place, fire prevention after the first flash of curiosity must not be allowed to drop out of sight. Habits of years and of generations are not changed by a statute. Fire

prevention must be constantly kept before the thoughts of men. To succeed in that, the manner of its presentation and application must be constantly varied, in order to hold the public interest. That work has been done, and splendidly, by the press of the Metropolitan District.

In the next place, during the winter and spring, the Commissioner made addresses in the evening before all the Central Labor Unions and many Locals throughout the district. He impressed on them the lesson that fire losses were borne pretty nearly per capita, falling on the wage earner as heavily as on the millionaire; that the intervening steps by which the losses were distributed led down to the individual; that a per capita fire loss of \$5 meant an annual burden of \$25 to the man with a wife and three children. He called their attention emphatically to the fact that the loss of life by fire falls mainly on the wage earners; that it is the children of the poor who are left at home unguarded, while the mother is away from home, perhaps doing hard work; that it is the workmen and the girls who are trapped in burning factories or apartment houses. He showed them the disastrous effect of factory fires on the wage earners, — the loss of the family's support, the competition of wage earners thrown out of work with other wage earners. He showed them, further, how these factory fires were frequently caused by the carelessness of the wage earner, — by cigars, a cigarette or a match. He asked them in the interest of their fellow wage earners, whose families might be involved in sorrow and want by a factory fire, to do their share to prevent factory fires. His remarks were without exception heard with close attention, and at times the union appointed a committee to co-operate with him. Section 13, subdivision J, gave the Commissioner power to prohibit or regulate smoking in factories. This is a frequent cause of factory fires. Last December he invited the Central Labor Unions to send delegates to his office for the consideration of this matter. He felt that they had the knowledge of conditions and motives that he needed. Moreover, their genuine co-operation was desired. The meeting agreed that absolute prohibition of smoking in factories would be worse than useless, — that it would drive many to

smoking in secret, and increase the danger of fire. They advised that an appeal be made to the workers. The following appeal was prepared and sent to every Local:—

DEAR SIRs:— You are interested, as I am, in bettering the condition of the wage earner and his family. You are interested, as I am, in protecting the life of the wage earner, and his chance to earn a living.

Every time a store, a shop or a factory is burned down, one, two or perhaps thousands of wage earners are thrown out of work, and their families suffer and frequently become dependent on the help of the community. When the wage earner loses his work he loses the means of supporting his life and the lives of his wife and children.

It becomes, then, a matter of the greatest importance to him that I should succeed in my work of preventing fires. It means clothing and food for him and his children.

Now, will the members of this Union help me in my task? I am trying to save the stores, the shops, the factories. Will they give me a helping hand? Will they give a helping hand to the wives and children of their brothers?

One of the commonest causes of fires in stores, shops and factories is smoking,— smoking pipes, or cigars or cigarettes. Just for the pleasure of a minute's smoke, perhaps a factory is burned down and many children are reduced to want.

The law gives me the right to forbid smoking in shops, in stores and in factories, but why should it be necessary to order the sympathetic, honest men of this Union to stop smoking in stores, shops and factories? I feel it is not necessary. I feel they are willing to forego the pleasure of a smoke in working hours in order to secure from want and suffering the wives and children of their brothers.

Men of this Union, you and I have the same purpose in view,— the greater happiness and comfort of the worker. Help me to accomplish this purpose by preventing fires that deprive the worker of the chance to earn a living.

Won't you give up your smoke in the factory? Won't you get other workers to do the same thing? It is a little sacrifice, but somewhere and sometime it will mean the difference between comfort and suffering to some poor worker and his little children.

Finally, won't you help me in all ways to guard against fire, the deadliest foe of the worker?

Yours very truly,

JOHN A. O'KEEFE,

Fire Prevention Commissioner for the Metropolitan District.

In the next place, a large percentage of fires in and about Boston are unquestionably due to arson. This statement cannot be proven as a mathematical problem, but it represents the belief of men who have had wide experience in the fire, police or insurance fields. Persons inclined to arson can be reached only, if at all, by inspiring fear of punishment. To that end the Commissioner has encouraged the chiefs of the various fire departments to ferret out the guilty persons, and in some instances he has caused to be published in the daily press accounts of conviction.

There remain the very large class of people who cause fires by their negligence, — people who put ashes in wooden barrels; who bring the gas jet and the curtain too close together; who smoke in bed; who toss burning matches about; who light brush fires; who hang clothes too near the stove; who neglect their chimneys. To what motive shall the Commissioner appeal in order to reach this class of men and women? He knew that a person was liable for damage naturally and proximately caused by his negligence. He believed that this doctrine applied to the man whose negligence had caused a fire that resulted in loss to others. He consulted a distinguished lawyer of Boston, and was assured that his view was correct. Here was a channel for reaching the minds of people whose negligence was the cause of fires. It would be for their self-interest to co-operate with the Fire Prevention Commissioner. He could not be on hand and check every act of negligence that might result in fire, but to this extent he had made the individual's self-interest his agent, and men became more careful about little acts of negligence when they learned that these little acts might sweep away their property. This legal opinion was given wide publicity through the press. In addition, the following notice of caution, based upon it, was published in several papers: —

FIRE PREVENTION.

Caution.

Persons are responsible in actions of tort for all damages caused by fires arising from their negligence or the negligence of their agents. The law is inclined to consider one's wife and children his agents in their acts and failure to act in and about his home.

Here are some of the common instances of such negligence. Avoid them.

1. Hot ashes in wooden receptacles.
2. Rubbish fires without a permit from the chief.
3. Careless keeping or use of matches.
4. Curtain blowing against unprotected gas jet.
5. Examining closets with lighted candle.
6. Rubbish collections in yard, cellar or attic.
7. Using gasoline or naphtha without a permit.
8. Oily rags or waste. (Burn them.)
9. Kerosene lamps not kept clean.

THE FIRE PREVENTION COMMISSIONER.

To enforce the lesson that a person, who, by his negligence in starting a fire, causing loss to another, is liable in damages, the civil prosecution of such persons was favored. Finally such case was tried in the Boston Municipal Court. A contractor, by improper use of a salamander, had caused a fire that destroyed a house in the town of Arlington. For this he was fined \$50 in the Cambridge District Court. The owner of the house collected insurance for his loss, and the insurance company then sued the contractor in the name of the owner. It recovered \$995. If cases of this kind become more frequent they will act as a decided check to fires arising from negligence. The case mentioned above was entitled *Domenico Geneste v. Domenico Manibito*, and the finding was made by the court June 21, 1915.

PLAN FOLLOWED IN FIRE PREVENTION WORK.

Before planning fire prevention work, the Commissioner sought information from every quarter. Daily reports of all fires in the district are sent to his office. These were carefully studied. A circular was sent to every insurance company doing business in the district. From the answers that were sent in with great courtesy and in a spirit of helpfulness, much information and many valuable suggestions were derived. Heads of fire departments were freely consulted. Valuable assistance was furnished by fire prevention departments in New York, New Jersey, Ohio, Indiana and Illinois. All this material was considered by the Commissioner in its application and relation to Boston problems. He decided not to visit other States where

the work was being done, in order that there might be no temptation to transfer to Boston and surrounding cities and towns methods that might not be suited to Boston's special conditions. The problem is a Boston problem, and must be worked out in Boston.

By the first of January he had decided to conduct the work along the lines indicated in the following outline, and he has continued substantially along these lines to the present time.

1. Educational.

- (a) Schools.
- (b) Wage earners; addresses and circulars.
- (c) Meetings of various kinds; addresses.
- (d) Newspapers.

2. Inspection and enforcement.

- (a) Inspection of premises by members of fire departments.
- (b) Orders issued from the office of the Fire Prevention Commissioner to be executed by members of the fire departments.

3. Inflammable fluids.

- (a) Establishment of regulations.
- (b) Full knowledge of location and use of inflammables to be in possession of fire departments.
- (c) Licensing of drivers of wagons transporting oils, to secure observance of regulations.
- (d) Stringent regulations for construction of public garages.
- (e) Oil plants and oil stations gradually to be constructed of fireproof materials.
- (f) Conferences with oil men in order to safeguard the public to the utmost.

4. Control of hazardous trades.

- (a) Removal of blacksmith and carpenter shops from tenement houses.
- (b) Storage of paints and oils; fireproof rooms for quantities over 10 gallons in one receptacle.
- (c) Storage of moving-picture films.
- (d) Manufacture and storage of explosives.

5. Hazardous occupancies.

- (a) Such occupancies to be removed from congested value districts.
- (b) Such occupancies to be removed from congested population districts.

6. Improvement of building laws.
 - (a) Influence of press.
 - (b) Ordinances and by-laws in cities and towns.
7. Improvements in fire departments.
8. Study of fire hazards not popularly known, for example: —
 - (a) The blower.
 - (b) Charcoal.
 - (c) Household cleansers.
9. Enforcement of statutes and ordinances relating to fire; for example: —
 - (a) Conditions in churches.
 - (b) Doors and elevators in factories.
 - (c) Manner of keeping matches.
10. Fire lessons and application.
11. Prosecutions for violation of fire prevention laws.

EDUCATIONAL WORK IN FIRE PREVENTION.

The greater part of the fire loss is traceable to carelessness; a large part is due to ignorance. To meet both these classes of cases the value of proper education is unquestioned. That education must be of the adult as well as of the child. It is especially needed in a community like eastern Massachusetts, where so large a part of the population has recently come among us. Education should check absolutely, in the end, the fires that arise from ignorance, and there would be less carelessness if people were properly acquainted with the probable result of their acts.

The education of the adults must be accomplished by keeping fire prevention constantly before the public mind; by addresses; by the press; perhaps by occasional prosecutions. The office of the Fire Prevention Commissioner can accomplish a great deal by sending timely material to the press, — perhaps statistics or cautions or information of new materials or methods that are dangerous or that may lessen the danger. The churches can do much in this line, and they have already shown a hearty willingness to co-operate. In all these ways the education of the adult may be accomplished.

The education of the child is a different and easier prob-

lem. Children are grouped in the schools, where they can be reached. For a large part of the day they are under the care of highly intelligent and public-spirited persons. It should not be supposed that the education of children in fire prevention has reference simply to the future. A very large percentage of the fires in some communities, and a considerable percentage in all communities, are caused by children. Instruction in the schools should reach most of these cases. I am well aware of the great demand made on the schools, and I appreciate the fact that the time given to such instruction must be limited.

The education of children in fire prevention reaches much farther than their own acts. It is the common experience of teachers, as well as the common knowledge of parents, that children are eager to relate and put into practice at home what they have learned at the school. If on a particular day the teacher's talk has been about hot ashes in wooden barrels, or curtains near a gas jet, or the danger of spontaneous combustion in the stove cloth, one may feel certain that the valuable information gained will be retold and put into practice at home.

April 13, 1915, the Commissioner addressed the Boston school principals, at Mason Street, on fire prevention and the need of instruction on the subject in the schools. The proposition was received in an altogether encouraging manner. Dr. Franklin B. Dyer, the distinguished superintendent of schools of the city of Boston, was hearty in his approval, and on his suggestion a committee of five masters was appointed to consider the matter with the Commissioner and to draft a practical plan for the work. That committee has already held several meetings, and it is certain that fire prevention instruction will be given in the Boston schools hereafter. In the other cities and towns of the district, authorities have shown the fullest desire to co-operate in the work, and teachers have been named by the superintendents to act with the Boston committee. All this promises good results.

CHANGES IN THE CUSTOMS OF THE PEOPLE.

Fire prevention cannot be accomplished by an edict. The causes of fire losses are very largely connected with the habits and customs of the people. These habits and customs have

been of long duration, and may have economic connections that make it difficult to change them. It would seem to be the duty of the Fire Prevention Commissioner to attempt the change. He is then quite likely to be brought face to face with economic and trade conditions which must be changed, and he must be stout hearted enough to face the problem. To illustrate, the glass kerosene lamp is the cause of many fires. Plainly it should be replaced by a metallic lamp. But the manufacture of glass lamps has gone on for a long time and they are sold cheap. The Commissioner attempted to meet this situation in the following way. He called a conference of representatives of all the oil companies about Boston. Representatives of department stores were also invited to be present. At that conference he gave data of fires that were due to kerosene lamps. He said to the men present that the glass lamp was responsible for most of the fires, and that in this way the glass lamp was largely handicapping the sale of kerosene oil. He asked their co-operation in substituting for it metallic lamps. The representatives readily took his view and appointed a committee to work the problem out. Representatives of department stores who were present at the conference expressed their desire to aid in the work. The hardware dealers will be approached and an attempt will be made to put prominently on the market safe kerosene lamps. This reform will have been accomplished very largely by the oil companies, who, although considerably affected by the gasoline regulations, have done splendid public-spirited work in their efforts to make fire prevention a success. They have at all times given the Commissioner the benefit of their expert knowledge, and they have faithfully observed the law and the regulations.

ESTABLISHMENT OF RULES.

Section 14 of the fire prevention statute provides that the Commissioner, after notice in at least two Boston papers, and two papers published outside of Boston, may establish regulations that shall apply throughout the district. Under that authority, regulations have been established for the following matters: out-of-door fires, gasoline regulations, storage of

moving-picture films, roof signs, sale of gasoline at water front, fireworks and firecrackers.

Before establishing regulations on any of these subjects the Commissioner was careful to obtain all the information available. The matters considered were discussed with persons representing all interests affected, both formally and informally, at conferences and at hearings. Over and over again the Commissioner's views or propositions were modified by a new view of the matter presented to him, or by proof that a proposed rule would work an unnecessary hardship, or that the end sought could be gained in a more satisfactory way.

The establishment of fire prevention regulations is a necessary but disagreeable duty. Regulations mean restriction; and a community that has been going as it pleased, in the use of gasoline, for example, cannot be expected at once to relish restrictions, even in the interest of public safety. In this field of his work the Commissioner has been all the more conservative and careful, because no appeal is provided from his decision. It seems a wise public policy that no appeal is provided, since it would constantly tie up and paralyze fire prevention work in the long delays of litigation. If decisions or regulations are unwise or arbitrary, the remedy lies in replacing the Commissioner.

Notwithstanding the difficulties of establishing so many regulations, there has been no complaint by any of the persons or interests involved, but on the contrary general satisfaction has been expressed.

In the establishment of regulations, it has frequently been an agreeable experience to have the very men who will be affected by the regulations join with the Commissioner in making them wise and practical. Indeed, that experience has been quite general in the Fire Prevention Department. In no part of the work was it more marked than in framing the regulations for the storing and keeping of paints and oils. This is covered by section 6 of the statute. That section outlined great changes in the paint and oil business, — changes that might be an oppressive burden to the trade. It required a fireproof room, or structure, for all paints and oils, in bulk or in barrel, exceed-

ing 10 gallons in total quantity, if kept within 50 feet of a dwelling house. Apparently this required that the total quantity of paints and oils, whether kept in large or small packages, should be added, and if it exceeded 10 gallons a fireproof room should be built. That section also provided that no paint shop, no matter what the amount of paints and oils carried, should be located in dwelling houses without the permit of the Commissioner. The painters were alarmed, and introduced a bill into the last Legislature to modify the law. Before the legislative hearing occurred, a committee representing the painters visited the Commissioner's office, and after a conference with him, their views were largely changed. At the hearing they appeared in considerable numbers and presented their case to him. The Fire Prevention Commissioner appeared in opposition. He stated that the law was new, and should have a fair trial; that methods in administering the law had removed many of the objections of the painters; and that at the end of a year, if the law seemed ineffective and unjust, he would be glad to join the painters in recommendations for its amendment. He proposed that the petition be referred to the next Legislature. The painters' committee agreed to the proposition, and that course was followed. Since that time, the committee representing the painters' association have worked constantly and earnestly with the Commissioner, and have given him valuable assistance in framing shop rules.

GASOLINE IN SEWERS.

On taking office last fall, one of the first questions that confronted the Commissioner was that of gasoline in the sewers. A serious explosion, causing loss of life, had occurred in East Boston a few months before. Investigation had disclosed the fact, and a court had so found, that this explosion was due to gasoline. At that time the generally accepted view was that this gasoline came from garages. The explosive vapors were found not alone in East Boston sewers, but in considerable quantities in all the main sewers. A possibility of grave disaster lay in this condition. On investigation, it was learned that by the installation of "separators" the gasoline could be removed from the water that flowed into the sewer. The Commissioner

gave notice that he proposed to install separators in all public garages. Hearings were held, and a campaign of publicity started. In the hearings it developed that large quantities of gasoline were used in dry-cleaning establishments, and even in the homes of the people, and that the person who used it allowed it freely to pass into the sewer. The outcome of the hearing and discussions was the incorporation of the following provision in the gasoline regulations: —

If the Fire Prevention Commissioner has reason to believe that volatile inflammable fluids are allowed to flow into the sewer from any garage, he may order that such garage shall be provided with a separator, trap or other device, approved by him, through which all drainage from said garage shall pass, for the purpose of preventing volatile inflammable fluids from flowing into said sewer. Said separator, trap or other device shall be kept at all times in good working condition, and shall be emptied at such intervals of time as will keep the said inflammable fluids from passing into the sewer. Violation or neglect of this regulation shall be sufficient reason for the withdrawal of the license for the garage.

Last January the Commissioner employed Arthur D. Little, Inc., of 93 Broad Street, Boston, to conduct an investigation of the Metropolitan sewers, in order to determine whether there had been a change in their condition. March 17, the following report was received: —

DEAR SIR: — On February 24 we took samples of air from sewers at a number of points specified below. These samples were tested at once for the presence of inflammable vapors such as those of gasoline. None of the samples showed explosive character, and none gave the odor of either gasoline or benzol.

The manholes at which samples were taken were, for the most part, those where explosive mixtures were obtained by a previous observer last June. We are advised that at the time such explosive samples were found, namely, last June, the odor of gasoline in all the manholes giving such result was strong and unmistakable. The employee of the Metropolitan Sewer Board who accompanied us further said that the odor of gasoline, at about the time of this previous investigation, was nearly always very noticeable, while for the past few months it had not been noticed at all. Two of our observers and the sewer department employee all agreed that at the time of our sampling, the gasoline odor was not present in any of the manholes tested. This checks the

negative result of our test, and indicates that, either through the campaign of publicity or otherwise, the practice of emptying gasoline into the sewers has been much reduced. Our conclusion is, therefore, that no appreciable amount of gasoline or its vapors was present in the sewers at the points tested.

Toward the latter part of April, Arthur D. Little, Inc., was directed to examine the Lynn sewer in the same manner. The following report of said investigation was received:—

DEAR SIR:—In conformity with your request, on April 26 we examined the sewerage system of the city of Lynn for the presence of gasoline. From the inspections made, which are furnished you in detail, we have to report that at the date of examination the Lynn sewers certainly contained no gasoline or other vapors in dangerous amounts, and probably contained none whatever. Also we conclude from examinations of garages that the danger of discharging gasoline into the sewer is understood by the garage men, and their practice as to washing and cleaning parts is correct.

It is the purpose of the Commissioner to have tests of the Metropolitan, the Boston and the Lynn sewers made from time to time, in order that he may be apprised early of conditions dangerous on account of gasoline. It is his purpose, also, in one way or another, to observe conditions in garages bearing on the flow of gasoline into the sewers. If evidence comes to him that gasoline is passing into the sewer from any garage, it is his purpose to order the installation of separators in that garage.

SALE OF GASOLINE ON WATER FRONT.

Last fall the Commissioner learned that gasoline was being delivered to boats at the wharves and along the docks of the city of Boston. This was a dangerous practice, since it was carried on in the midst of shipping of various kinds, and sometimes close to steamers carrying large numbers of passengers. Excellent regulations to control this sale of gasoline had been established by the District Police, but had fallen into disuse. The Commissioner adopted the regulations very largely in the form that the District Police had given them, restricted the sale of gasoline for boats to supply-vessels anchored in the

harbor, and sought the co-operation of the oil companies in the administration of the regulations. From time to time he has caused investigations to be made to determine whether the law was being observed, and has found everything satisfactory.

The gasoline supply-boats are usually old hulls that are given an anchorage in the harbor by the harbor master. They are a great advance over the practice of selling gasoline at the wharves, but they cannot be considered a final solution of the problem. They are unsightly and do not wholly eliminate the danger. The Commissioner has taken up with the Directors of the Port of Boston the matter of constructing a cement pier or storehouse at some safe and convenient spot, where the sale of gasoline to boats might be carried on. If that cannot be done it is likely that steel hulls will be required for supply-boats. A somewhat similar problem was encountered at Hough's Neck, in the city of Quincy. Gasoline was carried in open cans, and in large quantities, down to the shore between summer cottages, then over three floats, and finally stored in common tin cans in a little wooden enclosure on one of the floats. All the elements were present for a disastrous fire at this little summer place. Conditions have now been corrected, as far as the limitations of the place will allow, by placing a boat off the shore and by installing proper tanks.

CONDITIONS IN CHURCHES.

From time to time the attention of this department has been called to conditions existing in churches. The conditions of which complaint was made mainly related to crowding of aisles or improper exits. In all, fifteen churches have come under the observation of the department. The method adopted for treatment of these cases has been to send the complaint to the bishop's office, in case of churches possessing such organization, and in other cases to the pastor. Without exception the most gratifying readiness has been shown to comply with the law and to make the administration of the law a success. This department is aware that in many cases the changes suggested were made not only in the particular church where the question arose, but generally.

AUTOMATIC SPRINKLERS.

The value of automatic sprinklers is not open to question, and the fire prevention statute, in section 7, authorized the Commissioner to order their installation in buildings throughout the Metropolitan District in certain well-defined cases. In the first place, the building must be used in whole or in part for the business of woodworking or for the business of manufacturing or storing "wooden, basket, rattan or cane goods or articles, or tow, shavings, excelsior, oakum, rope, twine, string, thread, bagging, paper, paper stock, cardboard, rags, cotton or linen, or cotton or linen garments or goods, or rubber, feathers, paint, grease, soap, oil, varnish, petroleum, gasoline, kerosene, benzine, naphtha, or other inflammable fluids;" in the next place, four or more persons must live or be usually employed above the second floor. Section 11 gives the Commissioner authority to install in any basement dry pipes with outside connections. The Commissioner recognizes that it is the policy of the community to equip in the near future all business blocks in the heart of the city with automatic sprinklers, but he has ordered sprinklers only after a very careful investigation, after conferences with the owners, and in every case, so far, on the concurring recommendations of the Fire Department and the Building Department. He feels that the work must be done in a practical way; the worst hazards should be selected first, and orders for sprinklers should be distributed among different owners in such a way that too severe a burden may not be imposed upon individuals at one time. In about five months 99 orders for the equipment of business blocks with sprinklers have been issued. Of these, 79 were for sprinklers throughout the building, 8 were for basement only, 9 for basement and first floor, and 3 were for dry pipes in basement. Many of these buildings have now been equipped, and the work is progressing in all. Here, where dissatisfaction might naturally be expected, the Commissioner has been surprised at the spirit in which most owners of real estate have accepted his action. All desired a chance to state their views; they desired that their objections should be properly weighed, and if that

was done they accepted the decision. In determining what buildings in Boston should be equipped with sprinklers the Commissioner owes a great deal to the efficient and intelligent assistance rendered by the Boston commissioners, — Commissioner Grady of the Fire Department and Commissioner O'Hearn of the Building Department. To some extent sprinklers have been ordered in parts of the district outside of Boston, — in Lynn, Cambridge and Quincy. It is the policy of the department to carry out the spirit of section 10, and order their installation ultimately in all business blocks that have a hazardous tenancy with people living or working above the second floor.

BUILDING LAWS.

A very large part of the excessive fire loss in the Metropolitan District is due to antiquated building laws. Even in the thickly settled parts of large cities wooden construction is freely allowed and excessive size of wooden buildings is permitted. In several cities and towns the dangerous wooden shingle is still permitted. Dilapidated buildings are allowed to stand. All these conditions tend to increase the fire loss, and especially by exposure. Above all, the wooden shingle lays a city open to the dangers of a conflagration. It made possible the extent of the conflagrations in Chelsea and in Salem. The Fire Prevention Commissioner realized this, and on the 29th of October, 1914, he invited the cities and towns in the district to send representatives to a conference to be held in Room 425 at the State House for the purpose of discussing roof coverings. The cities and towns sent strong representative men to the conference, and a day was spent in discussing the matter. Samples of different roof coverings were on exhibition, and persons were present to explain the merits and state the cost of each. At the close of the day the meeting appointed a committee of five to consider the matter of roof coverings for cities and towns in the Metropolitan District, and to suggest an ordinance. That committee consisted of Mayor George H. Newhall of Lynn, chairman, Mr. Franklin H. Wentworth of Boston, secretary of the National Fire Protection Association, Capt. William Brophy of Boston, secretary of the Fire Chiefs' Club,

N. W. Bunker, chief of the Cambridge Fire Department, and Walter R. Forbush, Inspector of Buildings in Newton. They held many meetings, gave hearings freely, and finally adopted unanimously the following vote:—

Voted, That this committee recommend that each city and town in the Metropolitan Fire Prevention District enact the following provision as an ordinance or by-law: "The roof of every building in the Metropolitan Fire Prevention District, hereafter erected or re-covered, in whole or in part, and the top of every dormer window thereof, shall be covered and roofed with brick, tile, tin, copper, iron or such other incombustible or fire-resisting roofing as the Commissioner, by his certificate in writing, may authorize; but this section shall not be construed to prohibit the patching or minor repairs of shingled roofs."

This vote was communicated to all the cities and towns in the district. Several have acted upon it and some have gone far beyond it. The cities and towns that have recently improved their building laws are Boston, Brookline, Chelsea, Medford, Newton and Revere. The Commissioner will continue his efforts for improved building laws in the other communities.

NATURE OF THE COMMISSIONER'S WORK.

The duties of the Fire Prevention Commissioner in carrying on the methods of work outlined in this report are various. He must be qualified to address a meeting of educators and plan a system of work in the schools; he must be qualified and ready to address a labor union in any part of the district in the evening; he must preside in appeals or decisions from fire chiefs or from city or town governments, and admit or reject evidence offered by lawyers; he must conduct hearings; he must appear before a board of aldermen or a board of selectmen to advocate an improvement in the Fire Department or in the building laws; he must confer with a delegation of painters or carpenters in the attempt to draft regulations that will be unobjectionable; he must plan for the dissemination of information in regard to fire prevention work; he must inspect a city or town in company with its officials to determine its special problems; he must settle in a manner satisfactory to

all the neighborhood troubles that arise out of blasting; he must meet an influential owner of real estate to convince him that his building should be sprinkled; he must act on a \$2,000,000 oil plant, and immediately after on a one-car garage; he must keep in constant touch with all matters that come to the office, but the entire work has been made pleasant and easy by the splendid spirit of co-operation in the community.

The Commonwealth has intrusted very extensive powers to the Fire Prevention Commissioner. His work brings him into contact with nearly all lines of business; important franchises are in his bestowal, and from his decisions there is no appeal. At the present time the policy is experimental. The only justification for it will be efficient administration, speedy justice and uprightness of action. The community is justly entitled to these results from the Commissioner. Many of the more important duties are delegated under the statute by him to officials of cities and towns. From these officials the Commissioner properly expects the same efficient administration, speedy justice and uprightness of action. Franchises should be granted only from considerations of public interest without regard to private considerations of any kind. The Commissioner will insist on this. From all officials to whom authority has been delegated an appeal lies to the Commissioner. If the official has performed his part properly in the exercise of a reasonable discretion his decision will be retained.

RESULTS OF FIRE PREVENTION.

The time during which the Fire Prevention Department has been at work is yet too short to justify one in basing conclusions on the results attained. Complete figures of loss are not available later than April 30. A comparison of losses by fire in the Metropolitan District during the months of January, February, March and April of the year 1915 with the same months in 1914 shows that the fire loss for those months has been cut down during the present year. The following table gives the losses for each city and town for the months mentioned: —

Comparative Fire Losses for the First Four Months of 1914 and 1915.

	1914.	1915.
Arlington,	\$15,900	\$7,000
Belmont,	9,700	1,600
Boston,	1,419,000	1,313,900
Brookline,	15,600	18,400
Cambridge,	83,100	73,900
Chelsea,	34,200	71,400
Everett,	38,500	45,200
Lexington,	12,700	8,100
Lynn,	320,000	79,800
Malden,	50,600	124,900
Medford,	5,300	75,100
Melrose,	11,800	4,000
Milton,	2,300	3,500
Newton,	22,700	53,700
Quincy,	36,200	59,000
Reading,	100	6,600
Revere,	10,500	20,200
Rockland,	36,300	3,300
Saugus,	11,800	6,700
Somerville,	133,700	42,800
Stoneham,	3,300	4,900
Waltham,	8,500	9,100
Watertown,	11,200	8,400
Winchester,	1,900	6,000
Winthrop,	5,100	24,000
Woburn,	77,400	170,300
Totals,	\$2,377,400	\$2,241,800

This table shows a reduction of a loss in the entire district during the months in question of \$135,600. Of this reduction \$30,500 was outside Boston, and the rest was in Boston. The reduction of the loss by fire in Boston was remarkable and gratifying. It is exactly what the friends and advocates of fire prevention legislation had prophesied. The Boston Fire Department had the same efficient head, the same efficient men and the same equipment during the last three months of 1914, but the fire losses in Boston during the last three months of

1914 largely exceeded the fire losses for the same months in 1913. That is true, although in December, 1914, when the effect of the work done by the Fire Prevention Department was being felt, the loss was reduced. Commencing with January, 1915, the tremendous power of the fire prevention law, the extent to which the Fire Prevention Department had focused public attention on the subject, the information spread broadcast through the press, and the appeals made to the motives that control men's conduct had come to the assistance of the Boston Fire Department with telling effect. If the fire losses in Boston had not been cut down during the months January to April, 1915, the Fire Prevention Department would have been compelled to take the blame.

REPORTS OF FIRES.

Under sections 19 and 20 of the statute the Commissioner has required the following reports of fires: (a) A report from the Head of each Fire Department, giving the location of the fire in city, street and number, the date and time, the character of the fire, the class of building, the occupancy, the ownership, the value of the building, the names of the occupants sustaining loss and the amount of loss sustained by each, the part of the building where the fire originated and its use, the cause of the fire, and the statement whether the fire was accidental or intentional. (b) A report from the different insurance companies carrying insurance on buildings or contents injured by the fire and giving the following information: the location, date, classification of damaged property, class of building, supposed cause, the name of the insured, the kind of property, the sound value, the total loss, the companies carrying insurance on the property, the amount of insurance carried and the insurance loss.

From these two reports it is possible to check values and to obtain figures which are free from large errors.

The estimate of losses made by this department includes many losses not included in the lists of the Fire Departments or of the Boston Protective Association. Such losses are those incurred in fires that have been put out without the intervention of the Fire Department and on which insurance had been paid.

In this connection I desire to speak of the valuable work rendered to the Fire Prevention Department by the secretary, Mr. Harry E. Lake, in whose charge these statistics have been placed.

Mr. Lake is a graduate of the Massachusetts Institute of Technology, accomplished in the duties of the secretary's office, and unsparing in his efforts for the success of the department. His scientific training and knowledge have been of the highest value to the Commissioner.

In closing it is interesting to note that during the present year the expense of the department will amount to about 11½ cents for each person in the Metropolitan District.

APPENDICES.

APPENDIX I.

FIRE PREVENTION ACT.

CHAPTER 795, Acts of 1914.

AN ACT TO PROVIDE FOR THE BETTER PREVENTION OF FIRES THROUGH-
OUT THE METROPOLITAN DISTRICT.

SECTION 1. The words "metropolitan district", as used in this act, mean the following cities and towns and the territory comprised in them, to wit: Arlington, Belmont, Boston, Brookline, Cambridge, Chelsea, Everett, Lynn, Malden, Medford, Melrose, Milton, Newton, Quincy, Revere, Saugus, Somerville, Waltham, Watertown, Winchester, Winthrop and Woburn. The words "heads of fire departments", as used in this act, mean the fire commissioner or board of fire commissioners in those cities in the metropolitan district that have such an official or officials; the commissioner of public safety in Cambridge; the chief executive officer of the fire department of each of the other cities and towns within the metropolitan district, and the chief executive officer of the fire department of any fire district now existing or hereafter created in any one or more of said cities or towns under the provisions of sections forty-nine to seventy of chapter thirty-two of the Revised Laws or any similar statute. All the provisions of this act relating to cities and towns shall apply to such fire districts. The word "commissioner", as used in this act, means the fire prevention commissioner provided for in section two.

SECTION 2. The governor, with the advice and consent of the council, shall appoint a citizen of the commonwealth who shall have resided within the metropolitan district for at least three years, to be called the fire prevention commissioner for the metropolitan district, and for such cities and towns as may accept the provisions of this act as hereinafter provided the governor, with the advice and consent of the council, shall appoint a citizen of the commonwealth who shall have resided within the metropolitan district for at least three years, to be called the deputy fire prevention commissioner for the metropolitan district and for such cities and towns as may accept the provisions of this act as hereinafter provided, and who, in the absence or disability of the commissioner, shall exercise all of his powers and who at all other times shall perform such inspection or other duties as the commissioner may direct. The commissioner and deputy commissioner shall be sworn to the faithful performance of the duties of their office before entering

upon the same. The term of office shall be three years from the first Monday of August in the year nineteen hundred and fourteen. The commissioner or deputy commissioner may be removed by the governor, with the advice and consent of the council, for such cause as the governor shall deem sufficient, and the cause shall be stated in the order of removal. The commissioner shall appoint a secretary, who shall be sworn to the faithful performance of the duties of his office, and who shall keep a record of all proceedings, issue all notices and attest such papers and orders as the commissioner shall direct. His term of office shall be three years, but he may be removed by the commissioner for such cause as the commissioner shall deem sufficient, which shall be stated in the order of removal. The commissioner, deputy commissioner, and the secretary shall devote all of their time to the work of their respective offices. The commissioner shall receive a salary of thirty-five hundred dollars a year, and the deputy commissioner and secretary shall each receive a salary of twenty-five hundred dollars a year. Subject to the approval of the governor and council, the commissioner shall be provided with suitable offices suitably furnished and equipped for the performance of his duties. Subject to the approval of the governor and council, the commissioner may employ such clerks, stenographers and office employees, engineering and legal assistance as he may deem necessary.

SECTION 3. All existing powers, in whatever officers, councils, bodies, boards or persons, other than the general court and the judicial courts of the commonwealth, they may be vested, to license persons or premises, or to grant permits for or to inspect or regulate or restrain the keeping, storage, use, manufacture, sale, handling, transportation or other disposition of gunpowder, dynamite, nitroglycerine, camphine or any similar fluids or compounds, crude petroleum or any of its products, or any explosive or inflammable fluids or compounds, tablets, torpedoes, rockets, toy pistols, fireworks, firecrackers, or any other explosives, and the use of engines and furnaces described in section seventy-three of chapter one hundred and two of the Revised Laws, are hereby transferred to and vested in the commissioner.

SECTION 4. Power is hereby given to the commissioner to delegate the granting and issuing of any licenses or permits authorized by this act or the carrying out of any lawful rule, order or regulation of the commissioner or any inspection required under this act, to the head of the fire department or to any other designated officer in any city or town in the metropolitan district.

SECTION 5. All the powers and duties of mayors, aldermen, city or town clerks and other officers within the metropolitan district under sections seventy-three to seventy-seven, inclusive, of chapter one hundred and two of the Revised Laws are hereby transferred to and vested in the commissioner.

SECTION 6. No paint, oil, benzine, naphtha, or other inflammable fluid shall be kept or stored in bulk or barrel otherwise than in the tank of an automobile or motor boat or stationary engine in total quantity exceeding ten gallons in any part of any building used for habitation, or within fifty feet of any building used for dwelling purposes, unless such paint, oil, or other inflammable fluid is enclosed within a fireproof room or structure, constructed and arranged to the satisfaction of the commissioner, and no paint, oil, benzine, naphtha, or other inflammable fluid, except for domestic purposes shall be kept, used, stored or sold in any part of any building used for habitation, unless a permit therefor has first been obtained from the commissioner under such terms and conditions as he may prescribe.

SECTION 7. No part of any building used for habitation, nor that part of any lot within fifty feet of any building so used, shall be used for the storage, keeping or handling of any combustible article for other than domestic purposes, or of any article or material that may be dangerous to the public safety, as a fire menace, unless a permit has first been obtained therefor from the commissioner. No part of any such building shall be used as a carpenter's shop nor for the storage, keeping or handling of feed, hay, straw, excelsior, shavings, sawdust, cotton, paper stock, feathers, or rags, except under such terms and conditions as the commissioner may prescribe.

SECTION 8. The commissioner, or such person or persons as he may designate, may require the removal and destruction of any heap or collection of refuse or débris that, in his opinion, may become dangerous as a fire menace.

Neglect on the part of either the owner or occupant, or both, to remove the cause of complaint under the provisions of this or the preceding section, after notice thereof has been served, shall be deemed a refusal, and the commissioner or the person or persons whom he may designate, may at any time thereafter enter upon the premises and remove such material or article and the containers thereof as may be covered by or mentioned in the notice issued. The material or articles removed, if of no substantial value shall be destroyed, otherwise they shall be placed in storage, and the total costs attending such action shall be collected in the manner provided in sections sixty-seven, sixty-eight, and sixty-nine of chapter seventy-five of the Revised Laws.

SECTION 9. No salamander or stove for drying plastering shall be used in any building except under such conditions as may be prescribed by the commissioner, and no such salamander or stove shall be set upon a wooden floor unless it be raised above the floor at least four inches and set upon brick or other incombustible material in a bed of sand at least two inches thick, spread upon the floor and covering an area of at least two feet in all directions larger than the area of the salamander or stove.

SECTION 10. Any building within the metropolitan district used in whole or in part for the business of woodworking, or for the business of manufacturing or working upon wooden, basket, rattan or cane goods or articles, or tow, shavings, excelsior, oakum, rope, twine, string, thread, bagging, paper, paper stock, cardboard, rags, cotton or linen, or cotton or linen garments or goods, or rubber, feathers, paint, grease, soap, oil, varnish, petroleum, gasoline, kerosene, benzine, naphtha, or other inflammable fluids, and any building in the metropolitan district used in whole or in part for the business of keeping or storing any of such goods or articles, except in such small quantities as are usual for domestic use, or for use in connection with and as incident to some business other than such keeping or storing, shall, upon the order of the commissioner, be equipped with automatic sprinklers: *provided, however*, that no such order shall apply to any building unless four or more persons live or are usually employed therein above the second floor.

SECTION 11. The basements of any buildings within the limits of the metropolitan district shall, upon notice in writing by the commissioner to the owners of the buildings, be equipped with such dry pipes with outside connections as the commission may prescribe.

SECTION 12. Owners of buildings in the metropolitan district who, within six months after having received written notice from the commissioner under sections ten or eleven, fail to comply with the requirement of such notice, shall be punished by a fine of not more than one thousand dollars.

SECTION 13. In addition to the powers given by sections one to twelve, inclusive, the commissioner shall have power to make orders and rules relating to fires, fire protection and fire hazard binding throughout the metropolitan district, or any part of it, or binding upon any person or class of persons within said district, limited, however, to the following subjects:—

A. Requiring the keeping of portable fire extinguishers, buckets of water or other portable fire extinguishing devices on any premises by the occupant thereof, and prescribing the number and situation of such devices.

B. Prohibiting or regulating the accumulation, and requiring the removal, of combustible rubbish, including waste paper, cardboard, string, packing material, sawdust, shavings, sticks, rags, waste leather and rubber, boxes, barrels, broken furniture and other similar light or combustible refuse.

C. Prohibiting or regulating the setting or burning of fires out of doors.

D. Causing obstacles that may interfere with the means of exit to be removed from floors, halls, stairways and fire escapes.

E. Ordering the remedying of any condition found to exist in or

about any building or other premises, or any ship or vessel in violation of any law, ordinance, by-law, rule or order in respect to fires, and the prevention of fire.

F. Causing any vessel moored to or anchored near any dock or pier to be removed and secured in some designated place, provided that such vessel is on fire or in danger of catching fire, or is by reason of its condition or the nature of its cargo a menace to shipping or other property.

G. Requiring and regulating fire drills in theatres, public places of amusement, and public and private schools.

H. Requiring the cleaning of chimney flues and vent pipes.

I. Requiring proper safeguards to be placed and maintained about or over roof skylights.

J. Prohibiting or regulating smoking in factories, workshops and mercantile establishments.

K. Requiring that all signs and advertising devices erected on buildings shall be approved by said commissioner.

L. Causing to be made public all violations of fire prevention laws by posting placards on buildings or premises, and by publishing in the daily newspapers the names of the owners and specifying the buildings in which the violation occurs.

M. Defining the classes of buildings to be equipped with sprinkler protection under the authority of this act.

SECTION 14. The commissioner may provide that any of its rules shall apply generally throughout the metropolitan district or to any specified part of the district, or to any class or description of premises. No such rules applicable to the whole or any part of the metropolitan district or to any class of premises shall be established until after a public hearing of which notice shall have been given by publication in at least two successive weeks in at least two daily newspapers published in Boston and in two newspapers published in the metropolitan district outside of Boston.

SECTION 15. The commissioner is hereby authorized to require and order the heads of fire departments to investigate, observe and report to the commissioner all matters relating to fire hazards and fire prevention that he may designate, especially all violations occurring within their respective cities or towns of laws, ordinances, by-laws, rules or orders now in force or hereafter enacted by the general court or by the various cities and towns, or by the commissioner, relating to fires, fire hazard and fire protection.

SECTION 16. If any city or town or any head of a fire department or any officer, servant or agent of the commonwealth or of any city or town refuses or unreasonably neglects to obey any lawful rule, order or regulation of the commissioner such city or town upon information presented by the commissioner, shall be liable to a fine not exceeding

one thousand dollars, and such head of a fire department or other person shall be guilty of a misdemeanor and liable to a fine not exceeding fifty dollars for each offence, and the rule or order may, upon application of the commissioner, be enforced either by the supreme judicial court or by the superior court by writ or mandamus or otherwise. Violation or unreasonable neglect of such rules or orders by any person, firm or corporation, other than as aforesaid, shall be a misdemeanor and shall be punished by a fine not exceeding ten dollars for each day during which such violation continues after notice to the person or persons violating such rule or order. Such notice may be given by personal service or by posting the same in a conspicuous place on the premises affected thereby.

SECTION 17. The commissioner, or any person to whom the commissioner may delegate the authority, is hereby authorized to enter at any reasonable hour any building or other premises, or any ship or vessel to make inspection, or in furtherance of the purpose of any provision of any law, ordinance, or by-law, or of any rule or order of the commissioner, without being held or deemed to be guilty of trespass: *provided*, that there is reason to suspect the existence of circumstances dangerous to the public safety as a fire menace.

SECTION 18. The commissioner shall hear and determine all appeals from the acts and decisions of the heads of fire departments and other persons, acting or purporting to act under authority of the commissioner, done or made or purporting to be done or made under the provisions of this act, and shall make all necessary and proper orders thereupon, and any person aggrieved by any such action of the head of a fire department or other person shall have an absolute right of appeal to the commissioner.

SECTION 19. The heads of fire departments within the metropolitan district shall investigate or cause to be investigated the cause, origin and circumstances of every fire occurring in their respective cities, towns or fire districts by which property has been destroyed or damaged, and, so far as is possible, determine whether the fire was the result of carelessness or design. Such investigation shall be begun immediately upon the occurrence of the fire by the head of the department in whose territory the fire occurred, or by some person delegated by him, and if after making such investigation it appears to the head of the department that the fire is of suspicious origin, he shall immediately notify the commissioner of the fact. Every fire occurring in the metropolitan district shall be reported in writing to the commissioner within three days after the occurrence of the same by the officer in whose jurisdiction the fire occurred. Such report shall be in the form prescribed by the commissioner and shall contain a statement of all facts relating to the cause and origin of the fire that can be ascertained, the extent of damage thereof, the insurance upon the property

damaged, and such other information as may be required. The officials in any existing building department shall not be required to investigate the cause, origin or circumstances of any fire occurring in their respective cities, towns or fire districts.

SECTION 20. The commissioner may require every fire insurance company authorized to transact business in the metropolitan district to report to the commissioner through the secretary or some other officer of the company designated by the board of directors for that purpose, all fire losses on property insured in such company, giving the date and location of the fire. Such report shall be mailed to the commissioner within three days after loss on each fire, and the character of property destroyed or damaged, and the supposed cause of the fire shall be reported within ten days after adjustment is made. The report shall be in addition to and not in lieu of any report or reports which such companies may be required by law to make to the insurance commissioner or other state officer.

SECTION 21. The commissioner shall keep in his office a record of all fires occurring in the metropolitan district and of all the facts concerning the same, including statistics as to the extent of such fires and the damage caused thereby and whether such losses were covered by insurance, and if so, in what amount. The record shall be made daily from the reports made by the heads of fire departments and shall be public.

SECTION 22. In any case where buildings or other premises are owned by one person and occupied by another under lease or otherwise, the orders of the commissioner shall apply to the occupant alone, except where such rules or orders require the making of additions to or changes in the premises themselves, such as would immediately become real estate and be the property of the owner of the premises. In such cases the rules or orders shall affect the owner and not the occupant, and, unless it is otherwise agreed between the owner and the occupant, the occupant whose use of the premises has caused the making of such additions or changes, in addition to his rent or other payments shall, after the additions or changes are made, pay a reasonable per cent of the cost thereof annually to the owner of the premises. No rule or order shall be made or enforced which requires an expenditure by the owner or occupant of more than five per cent of the last annual assessed valuation of the land and buildings to which such rule or order relates.

SECTION 23. The commissioner shall annually, on or before the first day of August, transmit to the governor a full report of his proceedings under this act and such statistics as he may wish to include therein, unless some other time for reporting is fixed by law; and shall also recommend any amendments of the law which in his judgment would be desirable.

SECTION 24. It shall be the duty of the commissioner to study fire hazard and fire prevention and all matters relating thereto, to hear suggestions and complaints from all persons and from all cities and towns in the metropolitan district, to advise with the officers of such cities and towns, and from time to time to make suggestions to the general court and to the cities and towns looking to the improvement of the laws, ordinances, and by-laws relating to fire departments, construction of buildings, building or fire limits, use and occupation of buildings and other premises, protection of existing buildings, fire escapes and other life-saving devices, segregation and licensing of trades dangerous by reason of fire hazard, and all other matters relating to fire prevention and fire hazard.

SECTION 25. The salaries of the commissioner and deputy commissioner and of all persons appointed or employed by them, the rent and office expenses and other proper expenses and charges incurred by the commissioner in the discharge of his duties shall be paid by the treasurer of the commonwealth upon the requisition of the commissioner and shall be apportioned annually among the cities and towns in the metropolitan district, one half in proportion to their last annual taxable valuation and one half in proportion to the population as determined by the next preceding federal or state census. The amount so apportioned shall be added to their proportion of the state tax.

SECTION 26. The provisions of this act shall apply and extend to any and all such cities and towns in this commonwealth as, in the case of a city by a two thirds vote of its city council present and voting, and in the case of a town at any regular or special meeting called for that purpose, by a majority of its voters present and voting, may vote to accept the provisions hereof; and the words "metropolitan district" wherever they may occur in this act shall apply to and include every such city and town so voting.

SECTION 27. Except as is otherwise hereinbefore provided, any person violating any provision of this act shall be guilty of a misdemeanor and liable to a fine of fifty dollars for each offence, or, in case of a continuing offence after notice of such violation to a fine, not exceeding ten dollars for every day during which the violation continues.

SECTION 28. The provisions of this act shall apply only to the metropolitan district and to such cities and towns as shall accept the same in the manner hereinbefore provided.

SECTION 29. All acts and parts of acts inconsistent herewith are hereby repealed.

SECTION 30. This act shall take effect on the first day of August in the year nineteen hundred and fourteen. [*Approved July 7, 1914.*]

APPENDIX II.

CITIES AND TOWNS IN THE METROPOLITAN FIRE PREVENTION DISTRICT.

The following is a list of the cities and towns included in the Metropolitan Fire Prevention District, with the population according to the census of 1915, as nearly as can now be given: —

CITIES.

	Population, 1915.
Boston,	725,823
Cambridge,	107,395
Chelsea,	43,121
Everett,	37,635
Lynn,	95,028
Malden,	48,500
Medford,	30,138
Melrose,	16,834
Newton,	42,929
Quincy,	40,344
Revere,	25,097
Somerville,	86,223
Waltham,	30,047
Woburn,	16,338

1,345,452

TOWNS.

Arlington,	14,860
Belmont,	8,009
Brookline,	32,577
Lexington,	5,506
Milton,	8,611
Reading,	6,796
Rockland,	7,055
Saugus,	10,041
Stoneham,	7,473
Watertown,	13,667
Winchester,	9,316
Winthrop,	12,164

136,075

Total population, 1,481,527

APPENDIX III.

MEMBERS OF THE FIRE PREVENTION DEPARTMENT IN THE METROPOLITAN DISTRICT.

FIRE PREVENTION DEPARTMENT FOR THE METROPOLITAN DISTRICT.

Commissioner,	John A. O'Keefe.
Deputy Commissioner,	Michael A. Murphy.
Secretary,	Harry E. Lake.

FIRE COMMISSIONERS IN THE METROPOLITAN DISTRICT.

Boston,	John Grady.
Brookline,	W. W. Estabrook.
Cambridge,	Henry J. Cunningham.
Malden,	W. W. Campbell.

CHIEFS OF FIRE DEPARTMENTS IN THE METROPOLITAN DISTRICT.

Cities.

Boston:—

Chief of the Department,	Peter F. McDonough.
Senior Deputy,	John O. Taber.
Junior Deputy,	Daniel F. Sennott.
District 1,	John W. Godbold.
District 2,	Allan J. Macdonald.
District 3,	Stephen J. Ryder.
District 4,	John E. Madison.
District 5,	William Coulter.
District 6,	Edward J. Shallow.
District 7,	Peter E. Walsh.
District 8,	Wm. J. Gaffey.
District 9,	Joseph H. Kenney.
District 10,	Joseph A. Dolan.
District 11,	Henry A. Fox.
District 12,	Michael T. Mulligan.
District 13,	Michael Kennedy.
District 14,	Maurice Heffernan.
District 15,	Walter M. McLean.

Cambridge,	Nathaniel Bunker.
Chelsea,	David M. Hudson.
Everett,	Joseph T. Swan.
Lynn,	Edward E. Chase.
Malden,	George H. Butler.
Medford,	Charles Bacon.
Melrose,	Joseph Edwards.
Newton,	W. B. Randlett.
Quincy,	Faxon Billings.
Revere,	A. L. Kimball.
Somerville,	Sewall M. Rich.
Waltham,	George L. Johnson.
Woburn,	Frank E. Tracy.

Towns.

Arlington,	Walter H. Pierce.
Belmont,	John F. Leonard.
Brookline,	George H. Johnson.
Lexington,	Edward W. Taylor.
Milton,	J. H. Holmes.
Reading,	O. O. Ordway.
Rockland,	Fred Chapman.
Saugus,	Ernest Stuart.
Stoneham,	A. J. Smith.
Watertown,	John W. O'Hearn.
Winchester,	David H. DeCourcy.
Winthrop,	F. W. F. Woolcott.

BUILDING COMMISSIONERS IN THE METROPOLITAN DISTRICT.

Boston,	Patrick O'Hearn.
Brookline,	E. Lyon.
Lynn,	George A. Cornet.
Newton,	Walter R. Forbush.
Somerville,	Walter Littlefield.

BUILDING INSPECTORS IN THE METROPOLITAN DISTRICT.

Cities.

Cambridge,	Jeremiah Downey.
Chelsea,	James C. Denning.
Everett,	George H. Wood.
Malden,	C. George W. Bagge.
Medford,	Frank Blackett.

APPENDIX IV.

EXPENDITURES.

EXPENSES OF FIRE PREVENTION COMMISSIONER FROM AUGUST 1 TO
NOVEMBER 30, 1914.

	September.	October.	November.	Total.
Commissioner,	\$145 84	\$291 66	\$291 66	\$729 16
Deputy Commissioner,	—	—	183 30	183 30
Secretary,	—	—	166 66	166 66
Office salaries,	26 00	132 55	164 75	323 30
Travel,	—	—	6 66	6 66
Professional services,	—	12 50	—	12 50
Legal services,	—	—	170 00	170 00
Expert services,	183 26	258 33	111 65	553 24
Constable services,	—	—	—	—
Rent and light,	—	73 25	146 50	219 75
Telephone,	—	3 00	21 35	24 35
Advertising,	24 90	68 97	54 46	148 33
Printing,	99 34	287 38	304 46	691 18
Stationery,	43 43	37 65	187 56	268 64
Postage,	50 00	—	150 00	200 00
Books,	—	—	139 90	139 90
Mimeograph,	—	—	60 00	60 00
Typewriters,	—	172 13	81 00	253 13
Atlases,	—	—	1,412 10	1,412 10
Contingencies,	—	5 51	43 85	49 36
Totals,	\$572 77	\$1,342 93	\$3,695 86	\$5,611 56

EXPENSES OF FIRE PREVENTION COMMISSIONER FOR HALF-YEAR ENDING
MAY 31, 1915.

	Decem- ber, 1914.	January, 1915.	Febru- ary, 1915.	March, 1915.	April, 1915.	May, 1915.	Total.
Commissioner, . . .	\$291 66	\$291 66	\$291 66	\$291 66	\$291 66	\$291 66	\$1,749 96
Deputy Commissioner,	208 33	208 33	208 33	208 33	208 33	208 33	1,249 98
Secretary, . . .	208 33	208 33	208 33	208 33	208 33	208 33	1,249 98
Office salaries, . .	240 06	209 16	260 96	239 08	221 66	246 66	1,417 58
Travel, . . .	6 11	8 99	5 56	8 65	6 24	5 94	41 49
Professional services,	-	-	-	-	-	-	-
Legal services, . .	-	-	-	-	40 22	152 10	192 32
Expert services, .	299 96	60 00	23 94	11 43	2 14	-	397 47
Constable services, .	16 10	9 35	8 00	-	-	-	33 45
Rent and light, .	146 50	153 20	150 10	148 10	148 00	148 90	894 80
Telephone, . . .	14 30	15 50	15 78	15 95	14 84	29 86	106 23
Advertising, . .	200 04	105 17	77 10	17 40	-	93 69	493 40
Printing, . . .	34 41	23 03	47 59	106 26	120 71	41 15	373 15
Stationery, . .	82 13	44 16	28 23	54 60	53 99	81 82	344 93
Postage, . . .	-	-	-	-	-	150 00	150 00
Books, . . .	18 75	5 50	10 00	3 00	-	-	37 25
Mimeograph, . .	30 00	-	-	-	-	-	30 00
Typewriters, . .	81 00	-	-	-	-	-	81 00
Atlases, . . .	3 75	-	-	-	-	-	3 75
Contingencies, . .	25 92	13 10	15 43	6 16	6 01	5 42	72 04
Totals, . . .	\$1,907 35	\$1,355 48	\$1,351 01	\$1,318 95	\$1,322 13	\$1,663 86	\$8,918 78

[illegible]

APPENDIX V.

A PROCLAMATION BY HIS EXCELLENCY DAVID I. WALSH,
GOVERNOR.

On the ninth day of November, in the year of our Lord eighteen hundred and seventy-two, a disastrous conflagration destroyed a large part of the city of Boston, and brought unspeakable suffering on its people.

Since that time other prosperous cities of this Commonwealth—Lynn, Chelsea, Salem—have seen their magnificent industries, their noble public buildings and their happy homes devastated by the same deadly agency.

The loss and the woe inflicted on a community by fire are the price paid by the community for the negligence of its members. They are an evil which can be avoided. They are an evil which should be avoided.

In the first instance, indeed, a fire loss may be paid by insurance companies. In the end, it spreads out over the entire community, and adds to the burden of the wage earner. Every fire in an industrial establishment may deprive many of the chance to earn a living; and it becomes the interest of the wage earner to stay the fire loss.

With all these considerations in mind, this Commonwealth has recently established a department to have charge of fire prevention in the Metropolitan District. It is desirable that special emphasis should be laid on the work of this department and of other similar activities throughout the Commonwealth.

Therefore, I, David I. Walsh, Governor of Massachusetts, recommend that Monday, the ninth day of November, be observed by the people of this Commonwealth as Fire Prevention Day.

Let it be the aim and effort of the people of this Commonwealth on that day to fix attention on the great loss that is caused by fire each year; to set before the people the awful lessons of Boston, Lynn, Chelsea and Salem; to instruct the children in the dangers of fire; and especially, in and about their homes, and in their respective communities, to banish the conditions that result in fire loss; to the end that our homes may not be devastated, our people may not be impoverished and buried in woe, and the splendid structures of Massachusetts' thrift and industry may not be reduced to ashes.

Witness, His Excellency the Governor, at Boston, this second day of November, in the year of our Lord one thousand nine hundred and fourteen, and of the Independence of the United States of America the one hundred and thirty-ninth.

DAVID I. WALSH,
Governor.

By His Excellency the Governor.

FRANK J. DONAHUE,
Secretary of State.

APPENDIX VI.

REGULATIONS GOVERNING THE TRANSPORTATION, STORAGE AND USE OF VOLATILE INFLAMMABLE FLUIDS, AND THE CONSTRUCTION AND MAINTENANCE OF GARAGES IN CONNECTION THEREWITH.

DEFINITION.

1. The volatile inflammable fluids to which these regulations refer are gasoline, naphtha, benzine and other fluids that emit an inflammable vapor at a temperature lower than 30° F., to be ascertained by a standard closed cup tester.

LICENSES AND PERMITS.

2. Volatile inflammable fluids for domestic use may be kept in quantity not exceeding 1 quart in approved safety cans without permit or license.

3. Volatile inflammable fluids may be kept for private use in quantity not exceeding 130 gallons, with only the permit of the Head of the Fire Department; but this permit shall not authorize the keeping of gasoline in connection with a garage unless such garage is duly licensed or possesses the certificate for which provision is made in section 6 of these regulations. Not over 10 gallons may be kept in approved safety cans; over 10 gallons must be kept in approved tanks.

4. In the city of Boston, whoever desires to keep, use, store, manufacture or sell any volatile inflammable fluid in quantity exceeding 130 gallons, or in any quantity if used in connection with a garage, or for other than private use must obtain a license from the Street Commissioners. If such license be in connection with a garage it must have the approval of the Building Commissioner, otherwise it must have the approval of the Head of the Fire Department.

5. In all cities and towns of the Metropolitan Fire Prevention District except Boston, whoever desires to keep, use, store, manufacture or sell any volatile inflammable fluid in quantity exceeding 130 gallons, or in any quantity if used in connection with a garage with a capacity for more than two automobiles, or for other than private use, must obtain a license therefor from the Mayor and Board of Aldermen or from the Municipal Council in the cities or from the Board of Select-

men in the towns. Such license must have the approval of the Head of the Fire Department.

6. In any city or town of the Metropolitan Fire Prevention District except the city of Boston, if the Building Commissioner or Building Inspector, or in case there be no Building Commissioner or Building Inspector, or in case he fail to act, the Head of the Fire Department, shall certify in writing on blanks to be furnished by the Fire Prevention Commissioner that a building, or any part thereof, taking into consideration its construction and location, complies in all respects with the requirements hereinafter set forth for garages with a capacity for not more than two automobiles, then the occupant or occupants of said building or of the part thereof to which said certificate applies may keep therein for private use not more than 50 gallons of gasoline as follows: 10 gallons in approved safety cans, and the remainder in the tanks of two automobiles.

Said certificate shall be issued by the Building Commissioner or Building Inspector only with the approval of the Head of the Fire Department, and in every instance a copy thereof shall be filed in the office of the city or town clerk.

7. The right to keep gasoline in accordance with section 6 may be revoked by the Fire Prevention Commissioner on satisfactory evidence that the occupant of the premises in question is keeping therein more than two automobiles, or is not maintaining and conducting said premises in accordance with the regulations hereinafter set forth for garages with a capacity for not more than two automobiles.

8. In any building which was in existence May 26, 1911, and which is not used for human habitation, or situated within 50 feet of a building used for human habitation, as many as two automobiles may be kept without license or permit if such building is not used for holding gatherings of, or giving entertainment, instruction or employment to, more than 20 persons.

9. Notice of a public hearing on a petition to keep, use, store, manufacture or sell volatile inflammable fluids shall be given by mailing a copy thereof at least fourteen days before the hearing to abutting property owners and other persons interested within a reasonable radius of the building in which the license is to be exercised. But in the city of Boston, petitions for the storage, sale or use of volatile inflammable fluids in connection with garages, and all other petitions for the storage, sale or use of such fluids in excess of 1,000 gallons, may be advertised in the daily papers.

10. No person shall transport volatile inflammable fluids for hire or for sale over a public way of any city or town in the Metropolitan Fire Prevention District unless he has received a permit to do so from the Head of the Fire Department in the city or town in which he ordinarily engages in said business.

Such permit shall run for one year unless sooner revoked, and shall be valid in all other cities and towns in said district.

This section shall not apply to the employees of a licensed expressman or express company that has a general transportation permit from the Head of the Fire Department.

11. Individuals, firms or corporations desiring to use inflammable fluids in connection with the business conducted by them in the different cities and towns of the Metropolitan Fire Prevention District must get a permit therefor from the Head of the Fire Department in the city or town where such individuals, firms or corporations maintain an office or place of business.

12. A license for the manufacture, storage, use or sale of inflammable fluids in excess of 1,100 gallons may be reviewed, and if circumstances in his opinion warrant, may be reversed by the Fire Prevention Commissioner.

13. No motor cycle or motor triecyle shall be kept in any building or part of any building, except a licensed garage, unless a permit has been obtained from the Head of the Fire Department in the city or town in which said building is located.

14. The Fire Prevention Commissioner, or the official granting any license or permit, may revoke or suspend the same for due cause, after notice and hearing.

15. In case any official or officials to whom has been delegated the power to issue licenses, permits or the authority of approval, for any reason fail to act, the Fire Prevention Commissioner may act himself, or without further notice may delegate to other officials power to act.

TRANSPORTATION.

16. No person or corporation shall transport volatile inflammable fluids except in cans, tanks or containers approved by the Fire Prevention Commissioner.

17. No vehicle engaged in the business of transporting any volatile inflammable fluid over a public way in any city or town of said district, in quantity exceeding 25 gallons, shall approach nearer than 3 feet to any rail of a street railway, unless it become necessary to do so for the purpose of passing another vehicle or an obstruction, or for the purpose of avoiding an accident, or on account of insufficient space in the street. Before approaching nearer to said rail the person in charge of the vehicle shall look towards the rear, and hold out his arm so that it may be plainly seen by persons in charge of vehicles behind him that he intends to turn from the path in which he is proceeding.

18. At cross streets no vehicle transporting volatile inflammable fluids, in the quantity above mentioned, shall enter upon car tracks until it has been brought to a full stop, and until the person in charge of said vehicle has satisfied himself that it is safe to enter upon said

tracks. This section shall not apply to any automobile or motor truck that is not engaged in the business of transporting volatile inflammable fluids.

SALE AND DELIVERY.

19. No person or corporation, either personally or by servants or agent, shall sell or deliver volatile inflammable fluids in any city or town in said district except for domestic use to any person who has not a license or permit, nor in larger quantities than said license or permit authorizes. This provision shall not apply to sales delivered directly to the fuel tanks of motor vehicles, motor boats, airships, aeroplanes or other similar craft or vessels.

20. On the request of the Fire Prevention Commissioner every person or corporation that sells or delivers gasoline or other volatile inflammable fluids, personally or by servants or agents, in any city or town in said district, shall render to the Head of the Fire Department, in such city or town, on or before the tenth day of each month, a statement verified as to its correctness by an affidavit showing the total quantity of volatile inflammable fluids in excess of 1 quart delivered to each person in said city or town during the preceding month, provided, however, that no report shall be required of volatile inflammable fluids delivered directly to the tanks of motor vehicles, motor boats, airships, aeroplanes or other similar craft or vessels.

21. All deliveries of gasoline to storage tanks shall be made by daylight.

STORAGE.

22. All volatile inflammable fluids shall be kept in approved safety cans, tanks or containers.

23. Volatile inflammable fluids in total quantity not exceeding 65 gallons may, in the discretion of the Head of the Fire Department, be kept in approved tanks above ground, erected on non-combustible supports, if placed not nearer than 30 feet to any combustible building.

24. Except as otherwise provided, tanks for the storage of volatile inflammable fluids shall be installed outside of buildings underground on a solid foundation, which may be of earth. The tanks shall be entirely surrounded by earth well tamped in place, and they shall be not less than 2 feet below the surface of the ground.

25. All tanks that are to be buried must be inspected by the official granting the permit before they are covered over.

26. A tank containing volatile inflammable fluid, if within 10 feet of a building having a cellar or basement, and not placed below the level of the floor of such cellar or basement, shall be enclosed in Portland cement concrete not less than 6 inches in thickness.

27. If impracticable to locate a storage tank outside of a building,

it may be placed underground inside the building, but the top of the tank must be buried to a depth of not less than 2 feet.

28. No tank in excess of 560 gallons in capacity shall hereafter be installed underground inside of a building of more than one story in height unless such building is of fireproof construction.

29. Storage tanks with a capacity of not more than 65 gallons shall be constructed of galvanized steel not thinner than No. 16. U. S. gauge.

30. Underground storage tanks of more than 65 gallons' capacity, and less than 560 gallons' capacity, shall be constructed of No. 14 U. S. gauge galvanized steel, or $\frac{3}{16}$ inch black steel.

31. Tanks in excess of 560 gallons' capacity, and less than 1,100 gallons, shall be constructed of not less than No. 12 U. S. gauge galvanized steel or $\frac{3}{16}$ inch black steel. Tanks exceeding 1,100 gallons in capacity shall be constructed of galvanized steel or wrought iron of a minimum thickness, as follows:—

CAPACITY (GALLONS).	Minimum Thickness.
From 1,100 to 4,000,	No. 7 U. S. gauge.
From 4,000 to 10,500,	$\frac{1}{4}$ inch.
From 10,500 to 20,000,	$\frac{5}{16}$ inch.
From 20,000 to 30,000,	$\frac{3}{8}$ inch.

32. Tanks shall be riveted, welded or brazed, and shall be soldered or caulked to make them tight and strong.

33. Tanks, pipes and fittings designed for use underground shall be satisfactorily covered with asphaltum or some other rust-resisting material.

34. Where two or more tanks are installed underground inside of a building, and located less than 3 feet apart, there shall be between them a dividing wall of cement concrete not less than 6 inches in thickness.

35. Each storage tank must be provided with a filling pipe, a draught pipe, a vent pipe or a venting device approved by the Fire Prevention Commissioner, and may have a gauge pipe, the opening to which, when the tank is located in the basement, shall be protected preferably by some safety self-closing device.

36. All pipes shall lead from the top of tanks; and the top of all tanks shall be below the level of the lowest pipe used in connection therewith, except piping on the inside of tanks.

All pipes used for conveyance of volatile inflammable fluids must drain to tanks without traps or pockets, and shall be protected from mechanical injury.

37. All pipes except filler pipes connected with a tank for the storage of volatile inflammable fluid shall be of galvanized wrought iron or

galvanized steel or of brass, and shall have malleable iron or brass fittings. All screw joints shall be made up with litharge and glycerine.

38. Filler pipes must be made of galvanized iron not less than $1\frac{1}{4}$ inches in diameter, and extend to within 2 inches of the bottom of the tank.

The outer end of the filler pipe must terminate in a screw or close-fitting cap kept securely locked when not in use.

39. When a tank is located under a building the filler pipe and vent pipe which will be required on all tanks so located must run to the outside of such building.

40. When a filler pipe runs to a sidewalk, alley or public highway it must terminate in a screw or close-fitting cap kept protected by a cast-iron filler box, with iron cover set flush with the surface of the sidewalk at the curb, alley or highway, to be kept locked when not in use.

41. The vent pipe shall be of galvanized wrought iron not less than 1 inch in diameter, and shall run from the top of the tank and terminate at least 12 feet above the ground. It shall terminate not less than 10 feet from all openings in any adjacent building, and be protected with a double gooseneck opening downward, the openings to which shall be covered with a brass wire screen not coarser than No. 30 mesh, or with some other approved device.

42. All other systems for the storage of volatile inflammable fluids must be approved by the Fire Prevention Commissioner.

43. When a tank is located not less than 10 feet from any building an approved combination filling and vent pipe may, in the discretion of the official granting the permit, be used.

44. Volatile inflammable fluid, except where the hydraulic system is allowed, shall be drawn from the tank by means of a suction pump which shall have a tight shut-off valve on the nozzle. The pump or drawing-off device must be located on the floor of the garage or other building in a well-ventilated portion thereof. In no case shall there be a return waste pipe to the tank.

GARAGES.

45. An automobile garage or station is any building or part of any building wherein is kept one or more automobiles — not including motor cycles or motor tricycles — charged with or containing volatile inflammable fluid, or wherein is conducted the business of repairing motor vehicles.

46. All garages must have floors of cement concrete not less than 3 inches in thickness, or some other suitable non-combustible material of approved thickness.

All skylights located within 20 feet of any building of greater height than the garage shall have metal sashes and frames with wired glass.

All other skylights in any garage shall be protected on the outside with a screen of wire netting.

All windows which expose other buildings within a distance of 15 feet shall be fitted with metal sashes and frames with wired glass.

Wired glass in windows or skylights of garages shall not be less than one-quarter of an inch in thickness, with wire mesh not more than seven-eighths of an inch, and wire not smaller than No. 24 B. & S. gauge.

47. Garages are divided into three classes according to the kind of building construction employed, to be known as first, second and third.

48. First-class garages shall be built entirely of non-combustible material. Only first-class garages shall be built within the fire limits of any city or town, or within such section or sections as the Fire Prevention Commissioner, after conference with the Head of the Fire Department, may designate.

Steel garages with a capacity of not more than two automobiles shall be considered garages of the first class. They shall be located not nearer than 5 feet to any third-class building.

49. Second-class garages are those that have exterior walls of non-combustible material. All combustible construction on the interior must be suitably covered either with sheet metal, or with metal lath and cement plaster not less than three-quarters of an inch in thickness. All roof coverings must be of non-combustible or fire-resisting material.

Garages of the second class shall not exceed three stories in height, and may be located as near as 12 feet to any buildings except hospitals, schools, theatres, other places of public amusement or assembly, or buildings occupied as dwellings exceeding three stories in height.

50. Third-class garages are built of combustible material, except that they must have fire-resisting roof coverings. They shall not exceed two stories in height.

(a) If their capacity does not exceed two automobiles and if, in the opinion of the Building Commissioner or Building Inspector, such location does not involve any unusual hazard, they may be located as near as 12 feet to other buildings except as provided in the following section.

(b) If their capacity exceeds two automobiles they shall be located not less than 50 feet from any other building. Their interior walls shall be covered either with sheet metal, or with metal lath and cement plaster not less than three-quarters of an inch in thickness. Their ceilings shall be covered likewise, except in the case of one-story garages where there is a clearance of 12 feet between the floor and ceiling.

51. No building or other structure shall be fitted for or used as a garage under the following conditions:—

(a) If it be situated within 50 feet of the nearest wall of a hospital, school, theatre, any other place of public amusement or assembly, or a building occupied as a dwelling exceeding three stories in height;

provided, however, that the provisions of this section shall not apply to buildings in use as garages previous to the date of these regulations, except in cases where, in the opinion of the Fire Prevention Commissioner, the conditions involve unusual hazard. By special permit of the Fire Prevention Commissioner this regulation may be waived in favor of first-class garages.

(b) If it be occupied in any part as a hospital, school, place of public amusement or assembly, or dwelling house; provided, however, that a building in which is located a garage with a capacity for keeping not more than four automobiles, which are the property of the applicant for a permit, or his immediate family, and which are not let out for hire, may be used in part for a dwelling if the part so used is not located above the third story, and is separated from the garage by an unpierced non-combustible floor, and by non-combustible walls having no opening; and provided, further, that any windows in the garage that are directly below windows in the portion of the building occupied as a dwelling shall be fitted with metal sashes and frames with wired glass. All interior wood finish shall be covered with sheet metal, or metal lath and cement plaster not less than three-quarters of an inch in thickness. No part of such a building shall be occupied except by the applicant or his family, or those in his immediate service; and no volatile inflammable fluid shall be kept in such a garage except in the tanks of the motor vehicles or in a properly equipped and properly buried tank with a standard dripless pump.

(c) If in any part of it paints, varnishes, lacquers, resin, turpentine, gunpowder, smokeless powder, blasting powder or any other explosive or other highly inflammable material is manufactured, stored or kept for sale.

52. When any portion of a building or other structure is used as a garage, the garage shall be deemed to include all of the building not separated from it by non-combustible walls, floor and ceiling as defined in the following section or by superior construction as required for new garages for certain locations.

53. Non-combustible walls, floor and ceiling shall mean walls constructed of brick, stone, cement, hollow tile or cement blocks, or of metal lath and cement plaster not less than $1\frac{1}{2}$ inches in thickness supported by angle iron frames; floor constructed of cement concrete not less than 3 inches in thickness, or of some other suitable non-combustible material of satisfactory thickness; and ceiling constructed of metal lath and cement plaster not less than three-quarters of an inch in thickness. All openings in the walls and ceilings shall be sealed tight.

54. In any case where a building is divided by an unpierced fire wall at least 8 inches in thickness from foundation to 1 foot above the roof each portion of such structure shall be considered a building.

55. All elevator wells in second-class garages shall be built of non-

combustible material; elevator wells in third-class garages shall have their walls, if built of combustible material, covered with sheet metal, or metal lath and cement plaster not less than three-quarters of an inch in thickness; all stairways in garages having a capacity for not more than two automobiles shall be equipped with standard automatic closing fire doors that may be held open only by fusible links. In such garages, with a capacity for more than two automobiles, stairways shall be equipped with standard automatic closing fire doors to be kept open only by fusible links, and in addition, if built of combustible material, shall be lined with sheet metal, or with metal lath and cement plaster not less than three-quarters of an inch in thickness.

56. No pit shall be allowed in the floor of any garage or repair shop unless it be ventilated to the satisfaction of the Fire Prevention Commissioner; but this shall not be construed to prevent turning tables or elevator wells, provided the pits of the elevator wells be satisfactorily ventilated.

57. All basements used for the storage of motor vehicles shall have one or more independent exits direct to the outside air for use in case of fire.

58. No portion of a building below the street level shall be used for the storage or handling of volatile inflammable fluids, or as a repair shop for the business of repairing motor vehicles, unless so situated or constructed as to allow a free floor ventilation sufficient to remove all vapors therefrom.

59. No building, or part thereof, shall be converted into a garage unless it complies with all requirements of new garages of similar capacity and similarly situated.

60. Automobiles not exceeding two in number may be kept on the first floor in a private stable with horses or cattle, if the portion used for the automobiles is separated from the portion used for horses or cattle by a double partition of matched boards, or any superior construction, which may have an opening fitted with a substantial self-closing door; the portion used for the horses or cattle must have an independent exit to the outer air. More than two automobiles shall not be kept in the same building where horses or cattle are stabled unless the stable be separated from the garage by unpierced fire walls, floor and ceiling, and has a separate exit to the outer air; but no horses or cattle shall be kept over a garage. All such stables shall be separated from other buildings by the distance hereinbefore required for other garages of similar construction and capacity.

61. No garage shall exceed 10,000 square feet in floor area on any one floor unless authorized by a special permit from the Fire Prevention Commissioner.

62. By a special permit from the Fire Prevention Commissioner, apparatus for charging electric automobiles may be maintained in

garages under such conditions and restrictions as the Commissioner shall set forth in the permit.

63. A City Council or a Board of Selectmen, or any other official or board having jurisdiction, may make restrictions additional to those contained in these regulations relative to the location and construction of buildings used as garages.

64. If the Fire Prevention Commissioner, or the persons designated by him to exercise his authority in the respective cities and towns so direct, any building of more than two stories in height, having a wooden interior and in which a garage is maintained, shall have an approved automatic sprinkler system installed throughout the building except in such part as may be separated from the garage by proper fire walls and floor.

65. In case the statutes of the Commonwealth, the ordinances of a city or town, or the legal regulations of any city or town official or officials require superior construction of a garage for any reason, said statutes, ordinances or regulations shall be followed.

CHANGES IN EXISTING GARAGES.

66. On or before Aug. 1, 1915, in all existing buildings or structures used as garages, the floor of the first story shall be covered with cement concrete not less than 3 inches in thickness, or with some other suitable non-combustible material of thickness satisfactory to the Fire Prevention Commissioner.

67. On or before Aug. 1, 1915, all existing buildings or other structures used as public garages, or as business garages, or as garages having a capacity for housing four or more automobiles, in addition to the cement or other non-combustible floor set forth in the preceding section, shall comply with the following requirements: —

(a) All first-story walls and ceilings of garages that are located within 50 feet of any other building, if constructed of combustible material, shall be properly covered with sheet metal, or metal lath and cement plaster not less than three-quarters of an inch in thickness. In the discretion of the Commissioner it may be required that all such walls and ceilings in garages so situated shall be similarly covered. Such garages, if located more than 50 feet from any other building, shall be protected in accordance with requirements for third-class garages of a similar capacity.

(b) All combustible stairways and elevator wells shall be enclosed by walls covered with sheet metal, or metal lath and cement plaster not less than three-quarters of an inch in thickness, or with some other satisfactory non-combustible material.

(c) All doorways in said walls shall be fitted with standard automatic closing fire doors.

(d) All windows which expose other buildings within a distance of 15 feet shall be fitted with metal sashes and frames with wired glass, or shall be closed up solid with non-combustible material.

68. In case any garage has been made to conform with the regulations of the District Police, issued May 1, 1914, no further change will be required by virtue of the two preceding sections.

REPAIR SHOPS.

69. A repair shop may be conducted in the same building with any other garage if separated therefrom by non-combustible partitions with the openings into the garage protected by standard automatic fire doors.

70. No torch, forge, fire nor flame, nor any material sufficiently hot to ignite vapors which may be present, shall be used or maintained without a special permit in a building containing a garage unless used or maintained in a separate fireproof room in which no volatile inflammable fluids are kept, and the entrance to which is direct from the outer air, or to the garage through self-closing fire doors.

71. No volatile inflammable fluid shall be kept, sold or used in a motor vehicle repair shop. This section shall not apply to volatile inflammable fluid in the tanks of motor vehicles which are in such shop for repairs.

ARTIFICIAL HEATING AND LIGHTING.

72. Artificial heating of a garage shall be by steam or hot water system, and all heating plants shall be installed in rooms separated from the garage by unpierced fire walls, floor and ceilings, with an entrance from the outside only. No other system shall be used or allowed unless approved in writing by the Fire Prevention Commissioner.

73. No system of artificial lighting, other than incandescent electric lights, shall be used in any garage. The wiring for lighting, battery charging and electrical equipment must be installed in a manner at least equal to that required by the "National Electrical Code," and in accordance with the following regulations:—

(a) All cutouts, outlet and junction boxes, switches, receptacles, connectors, or other live metal parts, motors, dynamos, and all apparatus capable of emitting a spark, must be placed 4 feet above the floor or outside the garage. This does not apply to motors, dynamos and magnetos, which are a part of the automobile and properly cased.

(b) Motors, dynamos and electrical apparatus capable of emitting a spark, if not of the fully enclosed type, must be provided with brass wire screen of No. 30 mesh or finer over openings exposing sparks.

(c) Flexible cords for portable lamps, motors or other apparatus must be reinforced for rough usage. The live end of the cord must be the projecting part of an approved pin plug connector or equiv-

alent, so constructed that it will break apart readily at any position of the cord, and the opposite end, if terminating in a connector, must be the projecting part and protected against accidental contact.

(d) Flexible cables for battery charging must be of approved theatre stage type, and have approved connectors of at least 50 amperes capacity and constructed and arranged as in (c).

(e) All portable lights must be equipped with approved keyless sockets attached to approved portable lamp guards with handles and hooks. .

(f) All new wiring in garages, except flexible cords and cables as specified above and those used for pendant lamps, must be installed in approved metal conduit or approved armored cable, except that approved metal molding may be used in offices and show rooms.

OPERATION AND MAINTENANCE OF GARAGES.

74. Sawdust shall not be used to absorb oils in a garage.

75. There shall be constantly kept and maintained on the floor of every garage convenient receptacles filled with sand to be used in absorbing waste oils from the floors, and there shall be at least one fire bucket filled with sand and provided with a hand scoop for every 500 square feet of floor area or fraction thereof, to be used for fire-extinguishing purposes only.

76. A chemical fire extinguisher of not less than $2\frac{1}{2}$ gallons capacity, or chemical fire extinguishers equal thereto in efficiency, and approved by the Fire Prevention Commissioner, shall be furnished for each 1,000 square feet of floor surface or fraction thereof.

77. All garages shall be kept clean and the floor free from oils, oily waste or rags. Each floor shall be furnished with a sufficient number of self-closing metal cans, and all inflammable waste material shall be placed therein and removed daily from the building.

78. No person shall smoke in a garage, and notices to that effect in letters of vertical Gothic type, $2\frac{1}{2}$ inches or more in height, shall be conspicuously posted at the entrance to and within the garage. These notices may bear the words "BY ORDER OF FIRE PREVENTION COMMISSIONER" in letters of vertical Gothic type, three-eighths of an inch in height. Smoking in a garage shall be sufficient reason for the revocation of the license for the garage by the Fire Prevention Commissioner or by the Head of the Fire Department in the respective cities and towns.

79. No locker or other equipment constructed of wood shall be allowed in a first-class garage, or in a garage with a capacity for more than two automobiles.

80. No volatile inflammable fluid shall be put into or taken out of a motor vehicle where there is an open flame, and all lights, except electric lights, of a motor vehicle must be extinguished and the engine

stopped before filling the tank. If any volatile inflammable fluid be accidentally spilled in a motor vehicle, or on the floor or ground during the process of filling, such volatile inflammable fluid shall be cleaned up, allowed to evaporate, or the motor vehicle moved by hand to a place of safety before relighting the lamps or starting the engine.

81. No volatile inflammable fluid shall be carried about nor allowed to remain in an open receptacle in any garage.

82. Not more than 10 gallons of volatile inflammable fluids shall be kept in a garage at any one time, except such as may be in the storage tanks, portable filling tanks or the tanks of motor vehicles. Such volatile inflammable fluids shall be kept in and used from safety cans of an approved type.

83. No volatile inflammable fluid shall be allowed to flow upon the floor or to pass into the drainage system of a garage or other building.

84. If the Fire Prevention Commissioner has reason to believe that volatile inflammable fluids are allowed to flow into the sewer from any garage he may order that such garage shall be provided with a separator, trap or other device approved by him, through which all drainage from said garage shall pass, for the purpose of preventing volatile inflammable fluids from flowing into said sewer. Said separator, trap or other device shall be kept at all times in good working condition, and shall be emptied at such intervals of time as will keep the said inflammable fluids from passing into the sewer. Violation or neglect of this regulation shall be sufficient reason for the withdrawal of the license for the garage.

85. No volatile inflammable fluid from a storage tank shall be delivered to a motor vehicle in any garage except by means of a portable tank, approved covered cans, or directly through the outlet of the drawing-off pipe.

86. Each portable tank used in a garage shall be of a capacity not exceeding 65 gallons. It shall be mounted on a substantial iron or steel frame with rubber-tired wheels, and the fluid shall be discharged from the tank through a hose not exceeding 16 feet in length, having a shut-off valve close to the outlet or nozzle. Said tank shall be of a type approved by the Fire Prevention Commissioner.

87. No wagon or other vehicle engaged in the delivery of any volatile inflammable fluid shall be admitted to any portion of a garage.

88. Volatile inflammable fluid shall neither be sold nor handled, above the first story without the special permit of the Head of the Fire Department.

89. No volatile inflammable fluid shall be used for motive power for any stationary engine in a garage.

90. Not more than 120 pounds of calcium carbide in the aggregate shall be stored in a garage at any one time, and such calcium carbide shall be kept in water-tight metal containers, elevated not less than 6

inches above the floor level, the covers of which shall be kept securely fastened.

91. Not more than 1,000 cubic feet of compressed acetylene gas in detached tanks in the aggregate shall be stored in a garage at any one time, nor at a pressure exceeding 250 pounds per square inch.

GENERAL PROVISIONS.

92. Until further notice all materials, fittings or devices herein required, if formally approved by the Underwriters' Laboratories of Chicago, will be accepted by the Commissioner. Should it, however, be demonstrated to the satisfaction of the Commissioner that any material, fitting or device complies with the specifications of the Underwriters' Laboratories, the Commissioner may permit the use of the same.

93. The Fire Prevention Commissioner reserves to himself the right, by special permit, to provide for exceptional cases not foreseen in the preparation of the foregoing regulations.

94. Except as provided in the foregoing regulations or permitted by law, no volatile inflammable fluid that comes within the definition given in section 1 shall be, "kept, stored, used, manufactured, sold, handled, transported or otherwise disposed of" in the Metropolitan Fire Prevention District of Massachusetts.

NOTE.

Investigation of certain garage fires has shown that they were caused by the ignition of gasoline caused by a spark of frictional electricity. When gasoline is poured through a non-conductor, as a chamois strainer or rubber hose, frictional electricity may be generated in sufficient quantities to make a dangerous spark. The strainer, funnel, nozzle, etc., should be in metal contact with the fuel tank of the car, or some other method should be provided to carry away the frictional electricity as fast as it may be generated, so that a dangerous quantity cannot accumulate.

BOSTON, July 22, 1915.

The foregoing regulations governing the transportation, storage and use of volatile inflammable fluids, and the construction and maintenance of garages in connection therewith in the Metropolitan Fire Prevention District of Massachusetts, have been established by the Fire Prevention Commissioner after due notice and a public hearing.

JOHN A. O'KEEFE,
Fire Prevention Commissioner for the Metropolitan District.

APPENDIX.

In addition to the materials, fittings and devices approved by the Underwriters' Laboratories of Chicago, the Commissioner has approved the following safety cans which bear his label: —

McNutt Can Sales Company: —

Bench can.

The Eclipse can: 1 pint, 1 and 2 quarts, 1, 2, 3 and 5 gallons.

Globe can: 1, 2, 3 and 5 gallons.

Priming can: $\frac{1}{2}$ and 1 pint, 1 quart.

Plug closure can: 5 gallons, for garages only.

Tilting can: 1, 2, 3 and 5 gallons.

New England can: 1, 2, 3 and 5 gallons.

Sexton Can Company: —

Sexton can: $\frac{1}{2}$ and 1 pint, 1 and 2 quarts, 1, 2, 3 and 5 gallons.

APPENDIX VII.

REGULATIONS GOVERNING THE SALE OF GASOLINE AND
OTHER VOLATILE INFLAMMABLE FLUIDS FROM BOATS
AND VESSELS IN THE METROPOLITAN WATERS.

By virtue of the authority conferred on me by chapter 795 of the Acts of 1914, and after due publication of notice and a public hearing, I have this day, to wit, the first day of January, 1915, established the following regulations governing the sale and delivery of gasoline, or other inflammable fluids, to boats and vessels in the waters adjoining the cities and towns of the Metropolitan Fire Prevention District of Massachusetts: —

1. No gasoline, or other volatile inflammable fluid which emits a vapor at a temperature below 100° F. when tested in the open air, shall hereafter be delivered to boats or vessels in the waters adjoining the cities and towns of the Metropolitan Fire Prevention District of Massachusetts, except from vessels duly licensed by the Fire Prevention Commissioner, and at the stations assigned to them in said waters.

2. The application for such a license shall contain: —

(a) The name and address of the applicant.

(b) The name and length of the vessel from which the sales are to be made.

(c) The maximum amount of gasoline or other inflammable fluid to be kept in the vessel.

(d) The location desired for the vessel.

3. Vessels licensed in the manner above set forth shall be subject to assignment of location by the harbor master. In anchoring them two chains shall be used, one of which shall be attached to an eye-bolt in the bow of the vessel near the water line.

4. Gasoline, or any volatile inflammable fluid, kept for sale on such vessels, shall be stored in proper steel tanks. Such tanks shall not exceed in total capacity 1,100 gallons, except by special permit from the Fire Prevention Commissioner; and each tank shall be ventilated by a 1-inch pipe running 4 feet above the deck and properly braced, capped with a gooseneck and covered with No. 30 mesh brass wire screen. If a tank be located on the deck the ventilating pipe shall extend 4 feet above the tank.

5. Five barrels each of kerosene and lubricating oil may at any time be kept for sale on such vessels; and a larger amount of each fluid may be kept by special permit of the Fire Prevention Commissioner.

6. Each vessel duly licensed as above set forth shall be supplied with gasoline, or other volatile inflammable fluid, by supply-boats from stations properly equipped for that purpose, or in some other manner approved by the official granting the license. The supply-boats shall not enter docks nor make sales.

7. Gasoline or other volatile inflammable fluid shall be delivered from a licensed vessel either by means of a direct pipe from the storage tank or by using covered retainers.

8. Every vessel used for the sale of gasoline or other volatile inflammable fluid shall have the name, which has been stated in the license, properly printed on each side of the bow; it shall have one flag only, which shall be red, 3 feet long and 2 feet wide, bearing the word "Gasoline," or the name of the most inflammable liquid on sale, in large letters on both sides. This flag shall be constantly displayed on an upright pole.

9. No artificial light, except an electric light, shall be allowed on a vessel that is used for keeping gasoline or other volatile inflammable fluid for sale, unless required by law. No smoking shall be allowed on such a vessel, and no torch, forge, fire or flame without a special permit.

10. At all times there shall be kept on each licensed vessel a chemical fire extinguisher, two fire pails filled with sand and provided with scoops, and two pails with ropes attached thereto.

11. All permits granted under these regulations, and each licensed vessel, shall at all times be open to the inspection of the Fire Prevention Commissioner, or the members of the Police or Fire Department in the city or town where the vessel is located.

12. Nothing in these regulations shall prevent any yacht club or boat club in said district, provided it is duly licensed and has the approval of the Head of the Fire Department, from delivering gasoline or other inflammable liquid from a tank located on its pier or grounds direct to the tanks of vessels or boats belonging to its members, in such manner as the Fire Prevention Commissioner or the Head of the Fire Department where said club is located shall approve.

13. The Fire Prevention Commissioner may, for cause, revoke any permit or license issued as above provided.

14. These regulations shall take effect Feb. 1, 1915.

APPENDIX VIII.

SIGNS AND ADVERTISING DEVICES ON BUILDINGS.

By virtue of the authority conferred on me by chapter 795 of the Acts of 1914, and after due publication of notice and a public hearing, I have this day, to wit, the seventeenth day of February, 1915, established the following regulations governing signs and advertising devices on buildings, and for the maintenance of skylights and chimneys, in the cities and towns of the Metropolitan Fire Prevention District of Massachusetts: —

1. On and after the twentieth day of February, 1915, all signs and advertising devices erected on roofs of buildings in the cities of Boston, Cambridge, Chelsea, Everett, Lynn, Malden, Medford, Melrose, Newton, Quincy, Revere, Somerville, Waltham and Woburn, and in the towns of Arlington, Belmont, Brookline, Milton, Saugus, Watertown, Winchester and Winthrop, shall conform with the following requirements, and skylights and chimneys in said cities and towns shall be maintained as hereafter set forth.

2. No sign or advertising device shall be erected on the roof of a building in any of said cities and towns, unless the plan of its construction and erection has been approved by the Building Commissioner or Building Inspector of the city or town where the sign or device is to be located. In determining whether or not to approve any such sign or device, the said Building Commissioner or Building Inspector shall consider the strength of the roof, the safety of persons in the street, and the extent to which such sign or device may interfere with the work of the Fire Department. The Head of the Fire Department in the city or town where any sign or advertising device is situated may appeal from any decision of the Building Commissioner or the Building Inspector to the Fire Prevention Commissioner.

3. All roof signs and the frames to which they are attached, and on which they rest, shall be of non-combustible materials unless, in the opinion of the Building Commissioner or Building Inspector, the sign, or the frame, may, in consideration of special circumstances of location, and with proper regard for the public safety, be constructed in whole or in part of combustible material.

4. All fastenings, braces, stays and anchors shall be of wrought or malleable iron, or structural steel, properly secured to the roof timbers,

unless, in the opinion of the Building Commissioner or Building Inspector, they can be better secured otherwise.

5. Signs shall be fastened and ballasted in such a way that if the supports were destroyed the signs would not fall into the street.

6. When electrical signs are used the electrical equipment of same must be installed in a manner at least equal to that required by the "National Electrical Code."

7. The ends of roof signs shall extend not nearer than 3 feet to the side walls of the building, and the bottom of every roof sign shall be at least 4 feet above the roof.

8. No roof sign shall be so placed that it will cover any part of a window or other opening in the wall of a building.

9. On the written request of the Head of the Fire Department of any city or town, filed with the Fire Prevention Commissioner, that any existing sign or advertising device in said city or town be made to conform with the preceding regulations, or any of them, the Fire Prevention Commissioner shall forthwith appoint a time for a hearing on said request, and shall give four days' notice thereof to the owner, or the person maintaining said sign or device. If, at said hearing, it appear that said sign or device is likely to delay or impede the firemen in their work, then the Commissioner shall order such changes in said sign or device as may seem necessary.

10. Chimney flues and vent pipes shall at all times be kept reasonably clean, in such manner as not to constitute a fire menace to property.

11. Skylights shall at all times be kept intact and, on written request of the Fire Prevention Commissioner, or of the Head of the Fire Department in any of said cities or towns, any skylight shall be guarded in a suitable and satisfactory manner.

APPENDIX IX.

REGULATIONS GOVERNING THE STORAGE, KEEPING AND HANDLING OF INFLAMMABLE MOTION-PICTURE FILMS AND THE CONSTRUCTION AND MAINTENANCE OF BUILDINGS IN CONNECTION THEREWITH.

DEFINITION.

SECTION 1. In these regulations the term "inflammable motion-picture film" shall mean a film made of nitro-cellulose product or other similar substance which is made or used for the purpose of displaying motion pictures. The term "reel of inflammable motion-picture film" shall mean a quantity of such film aggregating not more than 1,000 feet in length.

LICENSES AND PERMITS.

SECTION 2. No building or other structure shall be used for storing, keeping or handling more than eight reels or a quantity aggregating more than 8,000 feet in length of inflammable motion-picture films except in accordance with the following regulations and unless a license has been issued therefor by the Mayor and Board of Aldermen of a city or the Selectmen of a town where the building or structure is situated. (Exceptions: in Boston the Street Commissioners, and in Lynn the Municipal Council, issue the licenses.)

A license is granted only after a public hearing, fourteen days' notice having been given by mailing a copy to abutting property owners and other persons interested within a reasonable radius of the proposed building.

Said license shall be effective only when approved by the Head of the Fire Department after an examination of the premises to determine the fire hazard. (Exception: in Boston the Building Commissioner approves the licenses.)

In case of a continuous occupancy of a building or structure for the storage, keeping, handling or manufacture of inflammable motion-picture films, a renewal of the license is not called for, but a certificate reciting such use and occupancy must be filed annually with the Head of the Fire Department and the Clerk in the city or town where such building or structure is situated.

SECTION 3. No building or structure shall be used for the manufacture of inflammable motion-picture film unless a license has been issued by the official or board authorized to grant such license. Said license shall be effective only when approved by the Fire Prevention Commissioner under such terms and conditions as he may prescribe.

SECTION 4. Application for a license for the storage, keeping or handling of inflammable motion-picture films shall be in writing and contain the following information:—

(a) Name and address of the applicant.

(b) Location of premises to be used for the storage, keeping or handling of said films.

(c) Plan showing proposed layout of the part of building or structure to be used for the storage, keeping or handling of said films, showing construction and the materials used in the construction.

(d) Height of building.

(e) All other uses of the building or structure.

SECTION 5. Violation or unreasonable neglect of any regulation or lawful order of the Fire Prevention Commissioner shall be sufficient cause for revocation or suspension of license by him.

CONSTRUCTION OF BUILDING.

SECTION 6. No building shall be fitted for or used for the storage, keeping or handling of more than eight reels or more than 8,000 feet in length of inflammable motion-picture films under the following conditions: *provided, however*, that the Fire Prevention Commissioner may by special permit waive any of the following conditions in case of a building now so used or in an extraordinary case where he does not deem it a menace to do so:—

(a) If it be of third-class construction.

(b) If it be more than two stories in height.

(c) If it be situated within 50 feet of the nearest wall of a hospital, school, theatre, any place of public amusement or assembly, or a hotel more than two stories in height.

(d) If it be used for any other purpose than a film exchange or such storage, keeping or handling of films.

(e) Unless the reels are stored on the top floor and at least one room is provided solely for the storage of each two hundred and fifty reels of such film.

SECTION 7. All elevator wells shall be provided with self-closing fire doors and well ventilated through the roof to the outside air.

SECTION 8. In all buildings hereafter fitted up for the storage, keeping or handling of inflammable motion-picture films, all doorways required to be fitted with automatic or self-closing doors shall have incombustible thresholds satisfactory to the Head of the Fire Department.

SECTION 9. Each storage room, as required in section 6 *e*, shall be constructed on a brick, cement or other suitable fireproof foundation extending to the ground. It must have walls of brick at least 8 inches in thickness, or of cement at least 6 inches in thickness, or of some other suitable incombustible material of satisfactory thickness. It must have a ceiling of steel and masonry constructed to the satisfaction of the Fire Prevention Commissioner. Except as is otherwise provided, all walls and ceilings shall be unpierced.

SECTION 10. Each storage room for inflammable motion-picture films shall be ventilated through the roof to the outside air by a metal vent pipe, not thinner than No. 18 U. S. gauge, having a cross sectional area of at least 70 square inches if one hundred or less reels of such films are stored therein, and a cross sectional area of 144 square inches if more than one hundred reels of such films are stored therein. It shall have an opening through incombustible material at the floor level to the outside air of at least 28 square inches in cross section and both ends covered with No. 16 mesh brass wire screen firmly fixed in place.

The large vent pipe provided for above shall be securely fastened to the steel work. It shall be surrounded by tile or other incombustible material of thickness satisfactory to the Head of the Fire Department (Building Commissioner in the city of Boston) where it passes through combustible material. It shall extend 4 feet above the highest point of the roof, and shall be so located as not to expose other property. The outside end of the vent pipe shall be covered with brass wire screen, not coarser than one-quarter inch mesh and protected from the weather by a device approved by the Head of the Fire Department. (Building Commissioner in the city of Boston.)

SECTION 11. Each room used for the storage of inflammable motion-picture films shall have a vestibule to be used only as a passageway into which the door of such room opens, constructed similarly to the room, or of other approved construction and properly ventilated through the roof. The vestibule shall have a window in the side of metal frame and sash with wired glass, and shall have a self-closing fire door at each end: *provided, however*, that a single room may have a vestibule without a window and with one self-closing fire door, with a wired glass window in it.

SECTION 12. All doors, shelves, fixtures and equipment of a room used for the storage of inflammable motion-picture films shall be of metal or other suitable incombustible material, and all doors shall be made smoke proof and self-closing.

SECTION 13. Each room for examining or repairing inflammable motion-picture films shall be separated from the rest of the building by fire-proof partitions with self-closing fire doors, located to the satisfaction of the Fire Prevention Commissioner, and so ventilated to the outside air as not to expose other property. It shall be used exclusively for examining or repairing such films.

SECTION 14. All doors, shelves, fixtures, equipment, furniture or fittings in a room used for examining or repairing inflammable motion-picture films shall be of metal or other suitable incombustible material.

SECTION 15. An exhibition room, accommodating not more than 12 people, may be fitted up and used for the purpose of sale, exchange or renting of inflammable motion-picture films, but not for public exhibition in a building where motion-picture films are stored, kept or handled. Such room shall be used solely for the purpose of exhibition.

By special permit the Fire Prevention Commissioner may grant permission for a larger exhibition room.

These exhibition rooms are subject to the regulations of the Massachusetts District Police.

HANDLING OF FILMS, SCRAPS, SUPPLIES, ETC.

SECTION 16. Not more than ten reels of inflammable motion-picture films shall be under examination or repair at one time in each room for such purpose.

SECTION 17. Each reel and part of reel of film shall be kept at all times in a separate metal box with tightly fitting cover when not being examined or repaired or used on a motion-picture machine for the exhibition of motion pictures. After Jan. 1, 1916, all films shall be in galvanized iron boxes approved by the Fire Prevention Commissioner.

SECTION 18. Inflammable motion-picture films while in transit shall be enclosed in fiber, leather or other suitable incombustible cases properly reinforced at the joints and on the corners with metal, and constructed and fastened in a manner satisfactory to the Fire Prevention Commissioner. They shall not be constructed to contain more than eight reels of such film unless authorized by special permit by the Fire Prevention Commissioner. They shall be deemed to be in transit when they are not in a room for the storage, keeping, handling, manufacture or exhibition of such films.

SECTION 19. Metal reels only shall be used for inflammable motion-picture films.

SECTION 20. In each room used for repairing or piecing together inflammable motion-picture films there shall be one metal can for each employee engaged in examining or repairing such films, wherein all waste parts and scraps of such films shall be placed and kept covered. The waste parts and scraps shall be removed daily and safely disposed of. In no case shall inflammable film be put in with waste paper, refuse or rubbish.

SECTION 21. No machines or other apparatus shall be used in a building wherein motion-picture films are stored, kept or handled unless approved by the Fire Prevention Commissioner.

SECTION 22. No inflammable cement or fluid in total quantity greater than one quart shall be kept in a room wherein inflammable motion-picture films are stored, kept or handled.

SECTION 23. No volatile inflammable fluid shall be kept or used in any building used for the storage, keeping or handling of inflammable motion-picture films.

HEATING AND LIGHTING.

SECTION 24. Artificial heating shall be by steam or hot water, and all heating plants shall be installed in rooms separated from the rooms used for storing, keeping or handling inflammable motion-picture films by unpierced fire walls, floor and ceiling. They shall not be placed directly under storage or examining or repairing rooms if such rooms are allowed on the next floor above them.

SECTION 25. No system of artificial lighting, other than incandescent electric lights, shall be installed in any room used for the storage, keeping or handling of inflammable motion-picture films. The electric wiring and equipment must be installed in a manner at least equal to that required by the "National Electrical Code," and in accordance with the following regulations: —

(a) All electrical apparatus allowed by the Fire Prevention Commissioner that is capable of emitting a spark, if not of the fully enclosed type, must be provided with brass wire screen of No. 14 mesh, or finer, over openings exposing sparks.

(b) All flexible cords must be reinforced for rough usage. The lamps on flexible cords which are long enough to allow the lamps to come within 6½ feet of the floor when hanging vertically must be protected by vapor-tight globes and wire guards attached to the sockets. They shall not be tied off from the normal position if there is any danger of breakage should the tie be broken.

(c) All electric lights in storage rooms shall be provided with vapor-proof globes. They shall be so placed that they will not be liable to injury.

(d) Any other electric lamp if so located that films can be set, or are liable to come while being handled within a distance of 18 inches from it, shall be provided with a vapor-proof globe and properly guarded.

(e) All electric lights in the storage and examining rooms, the vestibules, and in the exhibition booths must be provided with wire cages attached to approved keyless sockets. The switches for operating these lights must be placed outside the rooms or booth.

(f) All wiring of rooms used for the storage, keeping or handling of inflammable motion-picture films must be installed in approved metal conduits or approved armored cable.

FIRE PROTECTION.

SECTION 26. Each room, other than the storage room, containing inflammable motion-picture films shall be provided, for each 1,000 square feet of floor surface or fraction thereof, with a chemical fire extinguisher of not less than $2\frac{1}{2}$ gallons' capacity, or chemical fire extinguisher equal thereto in efficiency, and approved by the Fire Prevention Commissioner. It shall be provided with at least one fire bucket filled with sand and provided with a hand scoop for every 500 square feet of floor area or fraction thereof, to be used for fire-extinguishing purposes only.

SECTION 27. Means of egress sufficient to allow the maximum number of persons present at any time to get out quickly shall be available at all times at each end of a building used for the storage, keeping or handling of inflammable motion-picture films. Doors leading to the stairways or fire escapes in such a building shall be automatic closing fire doors, and kept unlocked when people are within the building. The locks on these doors shall be maintained in good condition and easily unlocked.

RESTRICTIONS.

SECTION 28. No person shall smoke in any room where inflammable motion-picture films are stored, kept or handled, and notices to that effect in letters of vertical Gothic type $2\frac{1}{2}$ inches or more in height shall be conspicuously posted in or at the entrance to each room so used.

SECTION 29. No torch, forge, fire, flame nor spark, nor any material sufficiently hot to ignite vapors or materials which might be present, shall be used or maintained in a room where inflammable motion-picture films are stored, kept or handled.

SECTION 30. No combustible material shall be kept or stored in a room where inflammable motion-picture films are stored, kept or handled.

SECTION 31. The Fire Prevention Commissioner may order the remedying of any condition which he may deem a menace from fire.

SECTION 32. These regulations shall go into effect March 5, 1915.

APPENDIX X.

REGULATIONS OF THE FIRE PREVENTION COMMISSIONER
GOVERNING THE MANUFACTURE, STORAGE, TRANSPORTATION, KEEPING, SALE AND USE OF FIREWORKS
AND FIRECRACKERS IN THE METROPOLITAN FIRE
PREVENTION DISTRICT OF MASSACHUSETTS.

CHAPTER 1.

Definitions.

SECTION 1. In these regulations —

(a) The words “common fireworks” shall be understood to include all fireworks and firecrackers that depend principally upon nitrates to support combustion, and not upon chlorates; that contain no phosphorus and no high explosive sensitive to shock and friction; that produce their effect through color and display rather than by loud noises. If noise is the principal object, the units must be small and of such nature and manufacture that they will explode separately and harmlessly, if at all, when one unit is ignited in a packing case. They must not be designed for ignition by shock or friction. Examples are Chinese or gunpowder firecrackers, Roman candles, pin wheels, rockets, colored fires, serpents, railway fuses, flare torches, etc.

(b) The words “special fireworks” shall include all fireworks and firecrackers that contain any quantity of red or white phosphorus, a fulminate or other high explosive sensitive to shock or friction; or that contain units of such size that the explosion of one while being handled would produce a serious injury; or that require a special appliance or tool, mortar, holder, etc., for their safe use; or that are intended for or may be ignited or exploded by shock or friction. Examples are high explosive firecrackers, bombs, salutes, toy torpedoes and paper caps, ammunition pellets fired in a special holder, railway torpedoes, etc.

(c) The words “high explosive” or “explosives” shall include all explosives more powerful than black gunpowder, composed of sulphur, charcoal and sodium or potassium nitrate, except smokeless powder and percussion caps.

(d) Toy torpedoes in quantity exceeding 5 cases, or 130 pounds, and paper caps in quantity exceeding 10 gross, or 30 pounds, are included

in the word "fireworks," but no toy torpedoes or paper caps shall be sold without a permit from the Head of the Fire Department or from the official designated by the Fire Prevention Commissioner to issue such permits.

(e) The weight of fireworks or firecrackers shall mean the weight of the articles complete, and shall include the container as well as the contents, but shall not include the wooden box or packing.

(f) The term "person" whenever used in these regulations shall be held to mean and include person or persons, firm or firms, and corporation or corporations.

CHAPTER 2.

Licenses and Permits.

SECTION 2. No person shall use a building for the manufacture of fireworks or firecrackers unless he has a license from the Street Commissioners of the city of Boston or the mayor and board of aldermen or the municipal council of other cities or the board of selectmen of a town. The license must bear on it in writing the approval of the Fire Prevention Commissioner.

SECTION 3. No person shall store, sell or keep for sale fireworks or firecrackers without a permit in writing from the Head of the Fire Department or from the official designated by the Fire Prevention Commissioner to issue such permits, and except in accordance with these regulations.

SECTION 4. A permit to sell fireworks or firecrackers at retail shall not be granted to be exercised in the same building with a permit to sell fireworks or firecrackers at wholesale: *provided, however*, that any person having a permit to sell fireworks or firecrackers at wholesale may, in the discretion of the Fire Prevention Commissioner, sell at retail in original packages; and *provided, further*, that the amount of fireworks and firecrackers kept is limited to the amount allowed under a wholesale permit.

CHAPTER 3.

Manufacture of Fireworks and Firecrackers.

SECTION 5. An application for a license to manufacture fireworks or firecrackers shall specify the following:—

(a) The present or proposed situation of the manufactory.

(b) The distance from adjoining buildings, streets and public places.

(c) The place and manner of keeping raw material, place and manner of storing finished product, and the name and maximum quantity of explosives or highly combustible materials to be stored.

(d) A detailed plan showing the arrangement of the various buildings of the manufactory and the nature of the work carried on in each.

(e) The methods to be employed to limit the destructive effect of explosives.

SECTION 6. No building shall be used for the manufacture of fireworks or firecrackers that is situated nearer than 200 feet to any building not used in connection with such manufacture, nor to any street, avenue or highway: *provided, however*, that the Fire Prevention Commissioner may waive the requirements of this and the following section in favor of buildings in use at the time these regulations go into effect.

SECTION 7. No building shall be used for the manufacture of fireworks or firecrackers that is situated nearer than 50 feet to any building used for the storage of explosives or finished fireworks, nor nearer than 25 feet to any other building within the factory enclosure.

SECTION 8. No license will be granted for the manufacture of fireworks or firecrackers unless the fabrication is carried on in charge of an experienced pyrotechnist.

SECTION 9. Nitroglycerine, guncotton, gunpowder, blasting powder or small arms ammunition shall not be manufactured at a fireworks or firecracker manufactory.

SECTION 10. The manufacture of railroad and ship signal lights, signal compositions and rockets shall be governed by the same regulations as control the manufacture of fireworks.

SECTION 11. The whole premises shall be enclosed with a suitable fence, and shall have such arrangements to enter it as will enable the management to have control of all persons entering the premises, and there shall be a sufficient number of notices to give warning of the business conducted therein posted conspicuously on the outside of said enclosure.

SECTION 12. When required in the license a competent watchman must be on guard except when the works are in active operation.

SECTION 13. All premises where the manufacture of fireworks or firecrackers is carried on, where the conveniences will allow it, must have one or more fire hydrants placed in the yard, or on the premises, with sufficient hose attached at all times to reach any part of the buildings where the manufacture or storage is carried on, and, where practicable, there shall be within 50 feet of each building at least 20 gallons of water in buckets fit and ready for use.

SECTION 14. All such manufactories shall, if convenient, be supplied with some means of communication with the Fire Department, such as telephone or alarm boxes for immediate notice in case of fire.

SECTION 15. Premises where fireworks or firecrackers are manufactured shall have heating and lighting systems which comply with the requirements of the Fire Prevention Commissioner.

SECTION 16. Magazines for the keeping of gunpowder or other explosives at a manufactory of fireworks or firecrackers shall be located in accordance with the requirements of the Fire Prevention Commissioner.

SECTION 17. No person under the age of eighteen years shall be employed in or allowed to enter any fireworks or firecracker manufactory except in the presence and under the supervision of some adult person.

SECTION 18. Smoking is prohibited within the enclosure of a fireworks or firecracker manufactory, and dry vegetation or rubbish of an inflammable nature shall not be allowed to collect within 50 feet of any building in such enclosure.

SECTION 19. Every owner or manager of a manufactory where fireworks or firecrackers are made shall make special rules, subject to the approval of the Fire Prevention Commissioner, for the regulation of the persons engaged or employed in or about such factory, to secure the safety and proper discipline of said persons and the safety of the public.

SECTION 20. All fireworks and firecrackers manufactured within the Metropolitan District shall bear the name of the manufacturer and the city or town in which they were manufactured plainly marked on the outside of the package and shipping case.

CHAPTER 4.

Storage of Fireworks and Firecrackers.

SECTION 21. All persons doing a general storage and warehouse business, before they accept any fireworks or firecrackers for storage, must obtain a permit from the Fire Prevention Commissioner.

SECTION 22. From July 10 to May 23 following, fireworks and firecrackers under a wholesale permit may be stored as specified outside of the fire limits of a city or town, and at such a distance from other buildings as in the opinion of the official granting the permit may be necessary for the public safety, but such distance shall not be less than 100 feet.

SECTION 23. The following fireworks and firecrackers under a wholesale permit, and as far as applicable under a retail permit, shall not be stored in any building in any city or town unless said building is located at a distance of not less than 300 feet from any other building: rockets exceeding in size "1-pound rockets," or any rocket the driving tube of which exceeds $1\frac{3}{16}$ of an inch inside caliber and 7 inches in length, mortar bombs, maroons, cannon bombs, artillery salutes, Italian bombardments, detonators, automatic torpedoes, son-of-a-gun torpedoes, firecrackers of more than 2 inches in length, containing chlorate of potash or other high explosive, and goods of a similar nature.

SECTION 24. From July 10 to June 1 following, fireworks and firecrackers under a retail permit may be kept in a specified building outside of the fire limits of a city or town, and at such distance from any other building as in the opinion of the official granting the permit may

be necessary for public safety, but such distance shall not be less than 50 feet.

SECTION 25. Sections 24 and 40 of these regulations shall not apply to pyrotechnical ship and railroad signals, and a permit may be granted for the keeping, storage and sale of such signals in the following places and of the following-named variety and maximum amounts: in small buildings exclusively used for the purpose and isolated on premises of railroads there may be stored not exceeding 250 gross railroad fusee signals and 500 gross railroad torpedoes at any one time; in other small buildings, or in rooms exclusively used for the purpose in other buildings on premises of railroads, there may be kept not exceeding 25 gross railroad fusee signals and 25 gross railroad torpedoes at any one time: *provided, however*, that not exceeding 25 railroad fusee signals and the same quantity of railroad torpedoes at any one time may be kept in a closed metal box in a storehouse or other place on railroad premises without a permit.

CHAPTER 5.

Transportation and Packing of Fireworks and Firecrackers.

SECTION 26. No fireworks or firecrackers shall be transported on or in any vehicle carrying passengers through any street or public way; no fireworks or firecrackers shall be transported in a vehicle on or in which there is any other explosive or highly inflammable material through any street or public way, except by a special communication from the Fire Prevention Commissioner permitting such transportation.

SECTION 27. Common fireworks for transportation must be in a finished state, as supplied to the retail trade, and be securely packed in strong, tight, sparkproof wooden boxes or barrels. Each package must be plainly marked "Common Fireworks. Keep Fire Away."

SECTION 28. Special fireworks for transportation must be in a finished state, as supplied to the retail trade; must be securely packed in strong, tight, sparkproof wooden boxes or barrels, and shall not contain a blasting cap or detonator. Each package containing special or a mixture of common and special fireworks must be plainly marked "Special Fireworks. Handle Carefully. Keep Fire Away."

SECTION 29. No fireworks or firecrackers, excepting the small firecrackers, containing a high explosive composition of a chlorate or perchlorate in excess of 50 per cent. thereof, shall be transported on or in a vehicle at any one time through any street or public way in an amount exceeding 300 pounds in the city of Boston and 500 pounds in other cities and towns of the Metropolitan District, unless a permit is obtained therefor from the Fire Prevention Commissioner.

SECTION 30. By special permit from the Fire Prevention Commissioner, fireworks or firecrackers may be transported on motor trucks as specified in the permit.

CHAPTER 6.

Storage and Sale of Fireworks and Firecrackers at Wholesale.

SECTION 31. Application for a permit to store and sell fireworks and firecrackers at wholesale must be made in writing, and shall describe the premises where the storage and sale are to be carried on.

SECTION 32. No wholesale permit will be granted for the storage or sale of fireworks or firecrackers, as follows:—

(a) In a wooden building within the fire limits of any city or town.

(b) In a building any part of which is used as a dwelling, school, for factory purposes or offices, or where people are accustomed to assemble.

(c) In any building or premises where dry goods of any kind or other light material of a combustible nature is kept for sale, excepting flags, paper lanterns, paper balloons or decorations, provided the said excepted goods shall be kept in boxes with closed covers until delivered to purchaser, or while such fireworks or firecrackers are stored on the premises.

(d) In any building used in whole or in part as a carpenter's shop or drug store, or in any building where kerosene or other inflammable liquid is kept or sold, or in any building where other explosives are kept or sold.

(e) In any building or premises where paints, oils or varnishes are manufactured or kept for use or sale.

(f) In any building or premises where matches, rosin, turpentine, hemp or cotton are stored or kept for sale.

(g) Where cigars or cigarettes are kept for sale at retail.

SECTION 33. From May 23 to July 10 in every year a wholesale permit may be granted to store and sell fireworks and firecrackers in a building in the following quantities: of common fireworks, as defined in section 1(a) of these regulations, not more than 800 pounds at any one time, exclusive of colored fire containing a chlorate or perchlorate with sulphur, of which not more than 200 pounds may be kept; of special fireworks, as defined in section 1(b) of these regulations, not more than 200 pounds at any one time may be kept; provided that this regulation shall not apply to the small firecracker, of which 1,000 boxes, each box containing not more than 2,400 such firecrackers, may be stored; nor to the toy torpedo, of which 200 cases may be stored; nor to the toy paper cap, of which 100 cases may be stored, nor to sparklers, of which one case, or 250 pounds, may be stored.

SECTION 34. Every person having a wholesale permit to store or sell fireworks or firecrackers shall, during business hours from May 23 to July 10, or during such part of the time as the permit may cover, have a competent person in distinctive uniform stationed in front of

the building in which he is authorized to store or sell fireworks or firecrackers, to prevent any one from entering the building with lighted cigar, pipe or cigarette, and to take such other precautions against fire as may be necessary.

SECTION 35. Every person to whom a wholesale permit is granted shall place and keep in convenient parts of the premises at least 30 gallons of water in buckets fit and ready for use in case of fire.

SECTION 36. All fireworks or firecrackers stored under a wholesale permit in broken packages shall be kept in boxes with closed covers, except when a change is made necessary by sale and delivery.

CHAPTER 7.

Keeping and Sale of Fireworks and Firecrackers at Retail.

SECTION 37. Applications for permits for the keeping and sale at retail of fireworks and firecrackers shall be made in writing, and must give the following information:—

- (a) Name of person by whom the permit is desired.
- (b) Situation of premises where goods are to be kept or sold.
- (c) Kind of building.
- (d) Nature of business in which applicant is engaged in said premises.

(e) Description of fireworks.

SECTION 38. No retail permit will be granted for the keeping or sale of fireworks or firecrackers, as follows:—

(a) In any building used in part as a tenement, lodging or apartment house, or used in part for school or factory purposes, or where people are accustomed to assemble.

(b) In any building where dry goods of any kind or other light material of a combustible nature are kept for sale, excepting flags, paper lanterns, paper balloons or decorations, provided the said excepted goods shall be kept in covered boxes until delivered, or while such fireworks are kept for sale.

(c) In a carpenter's shop or drug store or building where kerosene or any other inflammable liquid is kept or sold, or any building in which other explosives are kept or sold.

(d) In any building where paints, oils or varnishes are manufactured, or kept for use or sale.

(e) In any building or premises where tar, pitch, rosin, hay, cotton or hemp is manufactured, stored or kept for sale.

(f) In any room of a building where cigars or cigarettes or tobacco are sold.

SECTION 39. From June 1 to July 10, or during such part of the time as the permit may cover, any official designated to grant permits may, in his discretion, require any person holding a retail permit to

keep fireworks for sale to keep a competent person in front of his store during business hours to prevent any one from entering therein with a lighted cigar, pipe or cigarette, and to take such other precautions against fire as may be necessary.

SECTION 40. From June 1 to July 10 in every year a permit may be granted to keep for sale at retail fireworks and firecrackers in a building in the following amounts: of common fireworks, as defined in section 1(a) of these regulations, not more than 200 pounds at any one time, exclusive of colored fire containing a chlorate or perchlorate with sulphur, of which not more than 50 pounds may be kept; of special fireworks, as defined in section 1(b) of these regulations, not more than 75 pounds at any one time may be kept. This shall not include the small firecracker, of which 100 boxes, each box containing not more than 2,400 such firecrackers, may be kept; nor the toy torpedo, of which 50 cases may be kept; nor the toy paper cap, of which 25 cases may be kept; nor to sparklers, of which 10 gross may be kept.

SECTION 41. All fireworks kept in retail stores, excepting toy torpedoes and paper caps, shall be kept in wooden boxes with tightly closed covers, until delivered to purchaser, or while such fireworks are kept on the premises.

SECTION 42. No smoking shall be allowed about the premises where such sales are permitted, nor shall any person expose any of said fireworks or firecrackers for sale outside of the walls of a building, nor in any door or window, and safety matches only shall be sold on such premises.

SECTION 43. All persons to whom retail permits are issued shall place and keep in a convenient part of the premises where fireworks or firecrackers are kept for sale at least six pails of water to be used in case of fire.

CHAPTER 8.

Use of Fireworks and Firecrackers.

SECTION 44. No person shall use or discharge any fireworks or firecrackers in any city or town in the Metropolitan Fire Prevention District without a permit from the Head of the Fire Department or the official designated by the Fire Prevention Commissioner to issue such permit in the city or town in which the fireworks or firecrackers are to be used or discharged: *provided, however*, that on the days celebrated as the Seventeenth of June and the Fourth of July all fireworks and firecrackers allowed by these regulations may be used or discharged between the hours of 6 A.M. and 7 P.M., and such illuminating fireworks as are permitted, between the hours of 7 P.M. and 10 P.M.

SECTION 45. No rockets, bombs, aerial shells, Roman candles, Italian batteries or set pieces shall be set off except under the charge of an experienced adult person.

SECTION 46. No fireworks or firecrackers shall be set off within 300 feet of any hospital.

SECTION 47. The use of what are technically known as fireworks showers, and the use of any mixture containing chlorate of potash and sulphur in theaters or public halls of entertainment, are hereby prohibited.

SECTION 48. Mortars for discharging bombs shall not be used under any circumstances except in an enclosure, or on a float, prepared for a public display of fireworks, and then under the charge of an experienced pyrotechnist; and each mortar so used shall be placed not less than one-third of its length below the surface of the ground, or, if on a float, embedded in sand or earth of a like depth.

SECTION 49. In the display of fireworks great care shall be exercised by the management and those in authority present that the place which the bystanders occupy shall be beyond the danger area. By danger area is meant in this case such a distance from the point of display that no bystander's bodily safety will be endangered by the accidental discharge of the fireworks.

SECTION 50. No serpents, rockets, bombs or set pieces of fireworks shall be set off in a public street or public way.

SECTION 51. Under a special permit, illuminating fireworks for display shall be set off or fired between the hours of 7 P.M. and 12 P.M.

CHAPTER 9.

Miscellaneous Regulations on the Keeping, Storage, Sale or Use of Fireworks and Firecrackers.

SECTION 52. By special permit from the Head of the Fire Department, or the official designated by the Fire Prevention Commissioner to issue such permits, not exceeding 3 gross flare torches and 3 gross colored light torches, and not exceeding 50 pounds of colored fire in tin cans, at any one time may be kept for use or sale as specified in the permit.

SECTION 53. All premises used for storage or sale of fireworks or firecrackers must be lighted by gas or electricity, where such conveniences are to be had, and such lights must be protected with glass or wire globes or screens.

SECTION 54. No fireworks or firecrackers, excepting the toy torpedo or the single toy paper cap, shall be sold to children under thirteen years of age.

SECTION 55. No sparklers or other fireworks except railway and ship signal lights, with match or other sensitive heads, shall be kept or sold.

SECTION 56. Cigars or cigarettes containing any explosive material shall not be sold or kept for sale in the Metropolitan Fire Prevention District.

SECTION 57. The maximum amount of fireworks or firecrackers allowed by these regulations to be kept or stored in any building may be reduced in the discretion of the official granting the permit, but shall not be increased except by special permit from the Fire Prevention Commissioner.

SECTION 58. Fireworks or firecrackers shall not be hawked, sold or exposed for sale upon any public street, square or way, nor shall boxes or packages containing fireworks or firecrackers be allowed to remain on the sidewalk near the buildings where such articles are kept for sale.

SECTION 59. Any person keeping fireworks or firecrackers for sale shall have displayed over the outside of the principal entrance from the street of the store in which such fireworks or firecrackers are to be kept a sign on which shall be conspicuously painted, in capital letters, the words "Fireworks or Firecrackers [or both, as the case may be] for Sale."

SECTION 60. Where, in connection with any factory or with the storing or keeping for sale or use any fireworks or firecrackers, there occurs any accident or fire causing loss of life or personal injury, the owner or person in charge of said factory, or the storing, keeping for sale or use of such fireworks or firecrackers, shall forthwith send a notice and account of said accident to the Fire Prevention Commissioner.

SECTION 61. No torpedo larger than three-fourths of an inch in diameter shall be kept or sold. Torpedoes must be packed with sawdust in paper cartons and these in wooden cases.

SECTION 62. No smoking shall be allowed in any place where fireworks or firecrackers are handled in stock for sale or display.

SECTION 63. All unexpired permits for the manufacture, storage, sale or use of fireworks or firecrackers are hereby amended to conform with these regulations.

SECTION 64. These regulations constitute a minimum code, and if any city or town in the Metropolitan Fire Prevention District at present possess, or hereafter enact, ordinances or by-laws more restrictive in time, place or manner of the manufacture, storage, transportation, keeping, sale or use of fireworks and firecrackers, then such ordinances or by-laws shall have full force and effect in said city or town.

SECTION 65. These regulations will go into effect on June 4, 1915.

APPENDIX XI.

FIRES OUT OF DOORS.

By virtue of the authority conferred on me by chapter 795 of the Acts of 1914, and after due publication of notice and a public hearing, I have this day, to wit, the thirtieth day of October, 1914, established the following regulations governing fires in the open air throughout the Metropolitan Fire Prevention District of Massachusetts: —

1. In the cities of Boston, Cambridge, Chelsea, Everett, Lynn, Malden, Medford, Melrose, Newton, Quincy, Somerville, Waltham and Woburn, and in the towns of Arlington, Belmont, Brookline, Milton, Revere, Saugus, Watertown, Winchester and Winthrop, no person shall set or increase a fire in the open air except by the written permission of the Fire Prevention Commissioner, the forest warden or the Head of the Fire Department, or in cities or towns that have such an official, the Fire Commissioner: *provided*, that the débris from fields, gardens and orchards, or leaves and rubbish from yards, may be burned on plowed fields by the owners thereof, their agents or lessees; and *provided, further*, that persons above eighteen years of age may maintain a fire for a reasonable purpose upon sandy or barren land if the fire is enclosed within rocks, metal or other non-inflammable material; but every fire in the open air shall be at least 200 feet distant from any forest or sprout lands, and at least 100 feet distant from any building, and shall be properly attended until it is extinguished.

2. The provisions of the preceding regulation shall not apply to fires which may be set in accordance with regulations and methods approved by the superintendent for suppressing the gypsy and brown-tail moths.

These regulations will take effect Nov. 15, 1914.

SECOND ANNUAL REPORT
OF THE
FIRE PREVENTION COMMISSIONER
FOR THE METROPOLITAN DISTRICT,
MASSACHUSETTS.

FROM AUGUST 1, 1915, TO AUGUST 1, 1916.



BOSTON:
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The Commonwealth of Massachusetts.

To His Excellency SAMUEL W. MCCALL, *Governor of the Commonwealth of Massachusetts.*

SIR:— The Fire Prevention Commissioner for the Metropolitan District herewith submits his second annual report.

Very respectfully,

JOHN A. O'KEEFE,
*Fire Prevention Commissioner
for the Metropolitan District.*

FIRE PREVENTION COMMISSIONER FOR THE METROPOLITAN DISTRICT.

SECOND ANNUAL REPORT.

ALARMS AND LOSSES UNDER FIRE PREVENTION.

The Fire Prevention Commissioner for the Metropolitan District was appointed to office Sept. 16, 1914; the Deputy Commissioner was appointed October 21, and the Secretary, November 7. These three officials, with an office boy and six stenographers, constituted the entire working force of the department. The task assigned them was a new one in the Commonwealth of Massachusetts. The need of fire prevention had long been recognized, but the methods to be followed in realizing it could not be stated except in the most general terms. The entire plan of work had to be created, and then applied in twenty-six cities and towns, independent of one another, and possessing various forms of government and ordinance. Out of multiplicity must be brought uniformity; out of confusion, harmony. That was a task that could not be accomplished in a few weeks, or even in a few months. Yet it is of interest, and of some value, to consider changes in the number of fires and in the amount of fire losses throughout the district during the first year of fire prevention, that is, the year 1915.

In making a comparison of the number of fires in 1915 with any other year, it has seemed that the month of March should not be considered. March, 1915, was an exceptionally dry month; in fact, there was no measurable rainfall during the entire month. The result was that woods fires and other out-of-door fires necessitated constant alarms. Conditions became so bad that the Governor issued a proclamation extending the close season for game. In that one month the number of alarms throughout

the district was 3,389, while the normal number was about 800. Leaving out of consideration the month of March, the number of alarms of all kinds in the entire Metropolitan District for the year 1914 was 12,694; in the year 1915, the first year of fire prevention, the number of alarms was 9,933. During the part of 1916 that has passed, the decrease in the number of fires has continued. The following table gives the number of alarms in each city and town of the district during the month of June in the years 1914, 1915 and 1916:—

Number of Fire Alarms of All Kinds—Bell and Still—in Cities and Towns of the Metropolitan District for the Month of June in the Years 1914, 1915 and 1916.

	1914.	1915.	1916.
Arlington,	16	7	1
Belmont,	3	2	1
Boston,	580	423	285
Brookline,	31	29	14
Cambridge,	70	55	45
Chelsea,	44	34	27
Everett,	32	19	6
Lexington,	7	5	6
Lynn,	128	76	39
Malden,	40	28	28
Medford,	17	37	8
Melrose,	12	10	2
Milton,	12	7	7
Newton,	59	29	19
Quincy,	33	33	11
Reading,	11	1	5
Revere,	31	21	11
Rockland,	2	4	2
Saugus,	8	4	6
Somerville,	126	72	44
Stoneham,	7	1	2
Waltham,	18	12	9
Watertown,	9	10	6
Winchester,	17	5	3
Winthrop,	6	8	9
Woburn,	18	3	9
Total,	1,337	935	605

The decrease in the number of alarms thus far has been remarkable. If this decrease can be continued, even at a much lower rate, it will accomplish fire prevention.

The decrease in the fire loss throughout the district during 1915 was at a much lower rate. In comparing the fire loss, the month of March is not excluded.

In 1914 the fire loss throughout the district was \$4,671,295.94; in 1915 the fire loss was \$4,452,814.48. This was a decrease of \$218,481.46. In connection with this decrease, two facts should be remembered: in the first place, prior to 1915, the fire loss was increasing, and in the second place, the number of buildings and the population in the district are constantly increasing. The increase in the fire loss has been stayed, and the movement towards a decrease has been commenced. The figures are at hand for the fire loss in the cities and towns of the district outside Boston for the first four months of the present year. In those cities and towns the fire loss for the first four months of 1915 was \$958,400, and for the first four months of the present year, \$868,900. This indicates a progressive reduction. The comparison is not made with 1914 but with 1915, which itself showed a reduction from 1914.

It is perhaps natural that a campaign of education should at first show more marked results in a decrease of the number of fires than in a decrease of the fire loss. In most fires the loss is small; the greater part of the loss comes in a comparatively few fires. Those fires are in large establishments, or in congested value districts. They are reached not so much by a campaign of education as by improvements in fire departments, installation of sprinklers, removal of hazardous occupancies from congested value districts, and other similar measures that require more time for execution. Improvements are being constantly made in the fire departments of the district, many of them on the initiative of this department; hazardous occupancies are constantly being isolated or guarded; sprinklers are constantly being installed; and a more rapid decrease in the fire loss may be expected as these protective measures increase.

FACTORY FIRES.

Perhaps no class of fires is more disastrous in indirect consequences than factory fires. Not only is property, and in many instances life, destroyed in such fires, but the very means

of existence are taken from the families of workers. If the factory that is destroyed be a large one, hundreds of families suffer, and become dependent on the help of friends; if many factories be destroyed in a conflagration, as in Chelsea or Salem, perhaps thousands of families are exposed to privations of all kinds. The owner of the factory can look to his insurance, but the workman has no insurance on his wages. The distress falls on him with all its weight. If lives are lost they are usually the lives of wage earners. For these reasons the workman is especially and vitally interested in preventing factory fires. Smoking is the cause of many of these fires.

On pages 13 and 14 of the Fire Prevention Commissioner's first annual report is given an account of a conference held at the office of the Commissioner in December, 1914, with representatives of Central Labor Unions throughout the district. At this conference the question was discussed whether it would be wise for the Commissioner, in the exercise of the power conferred on him by section 13, subdivision J, of the Fire Prevention Act, to forbid smoking in factories. It was the unanimous opinion of the representatives of the Central Labor Unions that it would be unwise to do so; that it would drive smoking to cover, — to the out-of-the-way parts of the factories, where the danger would be increased. They recognized the evil of the practice, however, and advised that education and persuasion be used in the attempt to lessen it. The Commissioner was convinced of the wisdom of their advice. He abandoned the thought of correcting the evil by regulation, and instead, sent letters to all labor unions, distributed factory cards that called attention to the disastrous results of factory fires, and arranged for many addresses at labor meetings, either by himself or by others interested in the cause, in which were pictured the disastrous results of factory fires to the workers. In this campaign the Commissioner had the help and sympathy of employer and employee, for both were interested in the result at which he was aiming, and both approved the methods of work that he adopted.

It was reasonable to expect that the labor unions would give this work their hearty support. Labor unions are founded on the central principle that the pleasure and interests of the in-

dividual must yield to the pleasure and interests of all. They cannot but condemn the man who, for the pleasure of a smoke in working hours or in any hours within a factory, endangers the comfort and even the lives of fellow workers, or of the wives and children of fellow workers. As a matter of fact, the labor unions have given the work their hearty support.

The work commenced in December, 1914. In order to judge whether or not it was effective, the Commissioner has caused to be compiled the number of factory fires in the five months from January to June 1, 1915, and 1916. In these months in 1915 there were 113 factory fires throughout the Metropolitan District; in the same months in 1916 the number of such fires throughout the same district was 63. This is a reduction of 44 per cent., and the Commissioner considers it a justification of the methods followed. This reduction of 44 per cent. in factory fires during the months mentioned has been coincident with a very marked increase in the number of factories, and in the extent to which they have been used. The same methods will be pursued in the future.

FIRE DEPARTMENTS.

The Commissioner has endeavored to keep in touch with conditions in the different fire departments, and where improvement was urgent he has used his influence to obtain such improvements. Special investigations of fire department conditions were conducted in Cambridge, Milton, Saugus and Woburn, and recommendations were made to the governing bodies of those municipalities. In Woburn a very complete reorganization of the fire department has been effected, and the apparatus has been increased, through the energetic, intelligent work of Mayor Johnson, Chief Tracy and Acting Chief Buchanan. In that city new motor apparatus has been added, the number of fire stations has been reduced, the number of call men has been reduced, and the permanent men have been increased.

Throughout the district the motorization of apparatus has gone on rapidly, and fire houses are being reconstructed to adapt them to the housing of motor vehicles. In the fire de-

partment of the city of Lynn at present there is no horse-drawn vehicle. The number of permanent men in the different departments is being increased; and special attention is being given to the placing and maintenance of hydrants.

In the main, the twenty-six cities and towns of the district constitute one large area of contiguous populations, so that a person would not recognize that he was passing from one city or town to another. Under such conditions it is advantageous for the heads of the various fire departments to establish systems of reciprocal services, so that the firemen of one city shall respond to alarms on certain adjacent boxes in adjoining cities. Such systems have been largely established and are working well. They furnish to the communities that possess them a greatly increased security from fire loss, with no increased expense.

These systems of reciprocal services are based on voluntary agreements by the heads of the fire departments; are the results of actual, practical needs; and are an attempt to remedy the defects of the present system of independent departments in the different municipalities. The interests of the cities and towns in the Metropolitan District, in the prevention and extinguishing of fires, are very largely identical. The cities and towns are separated by artificial boundaries, yet in adjacent cities and towns fire apparatus and fire stations are duplicated, and marked differences exist in the nature and maintenance of the apparatus and fire houses, and in the discipline and pay of the firemen. In short, in adjacent cities or towns the most diverse policies may control the fire departments. All this is not conducive to efficiency. In the opinion of the Fire Prevention Commissioner the development of the Metropolitan District has reached a point where a Metropolitan fire department is absolutely demanded. Such action would in no sense be revolutionary. It would simply present on a larger scale the change that recently took place when Hyde Park was annexed to Boston.

AUTOMATIC SPRINKLERS.

There is no more effective method of preventing the destruction of life or property by fire than the installation of automatic sprinklers. The initial cost is sometimes considerable,

but the decrease in insurance rates will usually reimburse the owner in from three to ten years. In addition to that, factories and business blocks that are equipped with automatic sprinklers are more attractive to purchasers or to tenants than factories or blocks not so equipped. Last fall a Lynn business man, rather against his wishes, put automatic sprinklers in his block. Recently he said to the Commissioner that he wished some one had made him do this years ago. It had reduced his insurance rate from \$34 to \$17 on each thousand dollars of insurance. Again, last year a large wooden carriage factory in South Boston was equipped with sprinklers on the initiative of the Commissioner. In January of the present year, a fire broke out in that factory, and was held by the sprinklers to a trifling loss. After the fire the owner stated it as his belief that without the sprinklers he would have lost his entire plant. Instances like these have been numerous.

The fire prevention statute recognized the value of automatic sprinklers, and provided for their installation in sections 10, 11 and 12. Those sections are as follows:—

SECTION 10. Any building within the metropolitan district used in whole or in part for the business of woodworking, or for the business of manufacturing or working upon wooden, basket, rattan or cane goods or articles, or tow, shavings, excelsior, oakum, rope, twine, string, thread, bagging, paper, paper stock, cardboard, rags, cotton or linen, or cotton or linen garments or goods, or rubber, feathers, paint, grease, soap, oil, varnish, petroleum, gasoline, kerosene, benzine, naphtha, or other inflammable fluids, and any building in the metropolitan district used in whole or in part for the business of keeping or storing any of such goods or articles, except in such small quantities as are usual for domestic use, or for use in connection with and as incident to some business other than such keeping or storing, shall, upon the order of the commissioner, be equipped with automatic sprinklers: *provided, however*, that no such order shall apply to any building unless four or more persons live or are usually employed therein above the second floor.

SECTION 11. The basements of any buildings within the limits of the metropolitan district shall, upon notice in writing by the commissioner to the owners of the buildings, be equipped with such dry pipes with outside connections as the commission may prescribe.

SECTION 12. Owners of buildings in the metropolitan district who, within six months after having received written notice from the commissioner under sections ten or eleven, fail to comply with the require-

ment of such notice, shall be punished by a fine of not more than one thousand dollars.

It will be noticed that these sections make the authority to install sprinklers dependent on two conditions: first, the maintenance in the building of a hazardous, or a semihazardous occupancy; and second, the usual presence above the second floor of at least four persons. No matter how hazardous the business may be, unless four persons live or are usually employed above the second floor, under these sections automatic sprinklers cannot be ordered. No matter how high the building may be, or how many people may live or be employed above the second floor, unless there be a hazardous occupancy in the building, under these sections, automatic sprinklers cannot be ordered. Sprinklers cannot be ordered in buildings not above two stories, nor in lumber sheds, coal sheds, freight sheds, boat builders' sheds, car barns or many similar buildings even though the fire hazard be very great. Last year the officials of the city of Cambridge called the attention of the Fire Prevention Commissioner to conditions existing in coal and wood yards in the district between Main and Cambridge streets. All recognized the imminent hazard, but the Commissioner was without authority to guard against it. A few weeks later a disastrous conflagration destroyed one of these coal yards.

The Fire Prevention Commissioner, in administering the sprinkler sections of the statute, has no inspectors of his own on whom he can depend to call his attention to buildings in need of sprinkler protection. For that service he depends on the local officials, the fire departments, the building departments or the health departments. By one of these departments a report is made to him, stating the main facts that constitute the hazard of the building, and recommending sprinklers. The owner is then notified, and requested to call at the office of the Fire Prevention Commissioner. If he admit the need of sprinklers an order is issued at once; if he deny the need of sprinklers he is required to state his objections. These are then carefully examined, perhaps sent to the local officials who made the report, and perhaps made the basis

for a reinspection. The financial condition of the owner, the number of other similar obligations he may be under, the convenience of business carried on in the building are all considered. Sometimes, if the owner persist in his objections, a final inspection is made by the Commissioner or the Deputy Commissioner. Everything is done to eliminate injustice or a foolish expenditure of money. Finally, if the recommendation appear sound, an order for sprinklers is issued. Compliance with the order is required by law within six months, under a maximum penalty of \$1,000. It has not yet been found necessary to summon any owner into court; this may be due to the fact that so much care is exercised in deciding what buildings should be sprinklered.

Frequently, after an order for sprinklers has been issued, the owner will so improve the conditions in the building by removing hazardous occupancies, or by fireproofing, or by installing an automatic alarm, that the need for sprinklers is lessened or ended, and in such cases the order is modified or revoked. It has been stated that no owner has been called into court for refusing to obey a sprinkler order; it should also be stated that though it is common for owners to be represented by attorneys, yet no order of the Commissioner has been carried to the courts by the owner.

From June 1, 1915, to July 1, 1916, 219 sprinkler orders were issued by the Commissioner. Of these, 130 were for sprinklers throughout the building, 42 for sprinklers in the basement alone, 19 for sprinklers in the basement and first floor, and 28 were for sprinklers on various other floors. Twenty-one orders were modified or revoked for the reasons stated above.

The installation of sprinklers tends to reduce the insurance rates on a building; it also lessens the exposure hazard of adjoining buildings, and to that extent tends to reduce the insurance rates on adjoining buildings. It has been suggested by prominent real estate owners that it would be wise to sprinkler entire blocks in the congested sections of the city, in order that the security afforded each building might react to the advantage of its neighbors. It has seemed to the Commissioner that there was merit in this suggestion, and that it

might well be adopted, at the same time giving attention to isolated buildings where the fire hazard was great.

One practical limitation on the Commissioner in ordering sprinklers is the condition of the street on which the building stands. If the street has been newly paved the Commissioner feels that he should not cause it to be opened, except in cases of extreme urgency. An attempt has been made to meet this difficulty by sending to the Commissioner some weeks in advance a list of streets to be paved, in order that he may determine what work is to be done before the pavement is laid. That plan has sometimes failed for the reason that the examination of the list of streets required months of work by the inspectors of the fire department.

Similar to the sprinklering of entire blocks is the attempt of the Commissioner to install basement sprinklers in the entire business section of the city of Lynn around Central Square. Such a course would largely insure the heart of the city against a conflagration, and would soon result in a general lowering of insurance rates for that district.

REMOVAL OF HAZARDOUS OCCUPANCIES.

A third method of guarding against large fire loss is the removal of hazardous occupancies from congested value, or congested population, districts. Carpenter shops, paint shops, excelsior factories or warehouses, or other similar kinds of business in the neighborhood of large buildings stored with valuable merchandise, or in the neighborhood of large apartment houses or tenement blocks, largely increase the danger of loss of life or property by fire. It has been the policy of the Commissioner — a policy in which he has had the splendid, courageous support of John Grady, Fire Commissioner of Boston — to remove or at least lessen this danger. At times the policy may have seemed to work a hardship on the tenant or the owner, but it has plainly been in the interest of the public safety. One application of this policy has been the removal of blacksmith shops from tenement houses.

These three lines of work — the improvements of the fire departments, the installation of sprinklers, and the removal of

hazardous occupancies from congested value, or congested population districts — may be expected gradually to cut down the losses, as the campaign of education has cut down the alarms.

BLOWER SYSTEMS.

Blower systems that are used for the conveyance of stock or refuse have introduced into factories an additional fire hazard. In woodworking establishments they carry off the sawdust; in shoe factories, the leather dust; and in other factories, various kinds of refuse. The fine combustible material carried in the ducts, the rapidly moving air, and the manner in which a blower system branches into all parts of a factory make possible the rapid spread of fire once it has started. The spread of the fire is further facilitated by the coating that the dust forms on the inside of the duct. Fires from this cause are rapidly growing more frequent, with the increased use of blower systems. Such a fire may start in several ways. A man who is working at a machine that feeds into such a system may toss a partly consumed cigarette into it; particles of red-hot iron or emery dust carried into it may ignite the combustible dust; over-heated bearings that are improperly installed may set the dust afire; or even static electricity from the belt may ignite readily inflammable material that is allowed to accumulate near ducts. These fires are due to improper construction or improper maintenance of the blower systems. Other States regulate by law the construction or maintenance of blowers; Massachusetts does not. It is highly desirable as a precaution against factory fires that legislation should be enacted giving to some department authority to make rules for the construction and maintenance of blower systems. Such authority might be given to the Fire Prevention Commissioner in an additional subdivision under section 13 of chapter 795 of the Acts of 1914.

A fire of this character occurred at 21 Wormwood Street, South Boston, recently. The following letter in reply to an inquiry by the Fire Prevention Commissioner is interesting in that it states clearly the concrete particulars of the fire:—

Yours of February 2 at hand in regard to the fire which recently occurred in the blower used by —— Company, in the factory buildings,

21 Wormwood Street, South Boston, Mass., and in reply I would say that the dust spoken of in your letter comes from the grinding off of surplus leather and linings, together with tack heads which hold the same in place preparatory to applying the sole of the shoe. This grinding or smoothing is done on a machine called a "pounder," which is like a circular rasp and revolves very rapidly. The sparks are caused by grinding off the tacks. It is impossible to separate the tack dust from the leather dust at the machine.

Mr. — of the — Company says the apparatus they are now installing, consisting of a large blower and cyclone dust collector, will do away with the possibility of a fire in the future. The apparatus is guaranteed by the — Company, and is used by the largest shoe manufacturers. The connections between the machine and cyclone collector which they are now installing are short and direct; also the dust drops from the collector into the metal cans which are to be emptied twice a day, noon and night. The principal cause of the fire on January 27 was due to there being too many machines on one dust collector or blower; also to the long run of horizontal pipe which became plugged, and stopped any circulation.

This letter describes a condition of things that would be impossible under proper regulations; and then it shows how a few simple precautions will result in making impossible a similar fire. In the interest of the public safety, blowers should be regulated.

FACTORY FIRE DRILLS.

If a fire occur in a factory the one all-important thing is to get the operatives out as speedily as possible. At such a time, order, speed and the knowledge of what to do are of prime importance. These conditions can be expected only when operatives are to some extent familiar with the course that should be taken in case of a fire, and that knowledge is obtained only from factory fire drills. In New York City, and in other places, such drills are required by law. Usually in the lead, in industrial legislation, in this matter, Massachusetts is behind other States.

In many workshops the operatives are on the fourth, fifth or sixth floor; the floor space is crowded with shoe racks, benches and countless other things; the approach to the fire escape, through a window, is blocked by a bench, a table or perhaps a machine; the operatives may never have been told where the

fire escape is; there may be more than one stairway, but they have been accustomed to use a particular one; no one is in command to direct their exit from the burning building. These are actual conditions, and it can readily be seen that they are conditions that might lead to disastrous results. Fortunately, we have had few factory fires that have resulted in loss of life; but in factory fires as in school fires it is the exceptional against which we must guard.

Factory drills will familiarize the operatives with the things that should be done in case of an actual fire; moreover, they will disclose and cause to be corrected the negligence of some employers in crowding factory floors, blocking passages to fire escapes, and permitting other conditions that confuse or retard the exit of the operatives. Legislation should be enacted requiring fire drills in workshops above the second floor, and containing above a stated number of operatives.

Already in Boston some industrial establishments have recognized the need of fire drills, and have voluntarily adopted them. The operatives are organized with leaders on each floor; specific duties in the matter of opening exits and using portable extinguishers are assigned to certain persons; and every one is instructed in the course to be followed when the fire signal strikes. After that, occasionally, the signal is given at times that will least interfere with the business of the establishment. The Fire Prevention Department is ready, on request, to organize fire drills in shops or factories.

DWELLING HOUSE FIRES.

By far the larger part of the fires in the Metropolitan District break out in dwelling houses. It is a difficult class of fires to reach successfully. They are due largely to ignorance or negligence on the part of the person in charge of the house. Regulations made to prevent them could not be enforced. It appears to be a field where the hope of fire prevention depends on education.

In the city of Lynn in 1915 there were 28 factory fires, 17 store fires and 173 dwelling house fires. At the beginning of the year the Commissioner commenced special work to reach dwelling house fires in Lynn. (1) He asked the municipal coun-

cil to enact an ordinance requiring the inspection of the heating plant in every apartment house, lodging house or tenement house during the months of September and October each year. Such an inspection would disclose the defective furnaces, heat pipes and chimneys that cause many fires during the early part of the winter. (2) He prepared a leaflet of four pages dealing in a simple manner with the different kinds of dwelling house fires, and caused it to be distributed to all school children. (3) Inasmuch as most dwelling house fires arise from conditions under the control of women, it seemed that some effort should be made to educate the women of the city in the common causes of dwelling house fires. The most effective way seemed to be by short addresses to clubs and societies of all kinds, composed wholly or in part of women. Many business and professional men of the city volunteered to make these addresses, the arrangements being all perfected in the office of the Commissioner. The newspapers of the city announced each address, and usually gave its substance the following day. This plan was followed through the months of January, February and March. It was such as might naturally be expected to decrease dwelling house fires. Whether as a consequence of this work or not, dwelling house fires did decrease in Lynn, in a marked degree, during the first part of the present year. In the first five months of 1915 there were 93 such fires in that city; in the first five months of the present year the number fell to 46. It should be added that the leaflet distributed in the Lynn schools was distributed in all schools throughout the district.

An effort will be made during the coming fall to have cities and towns adopt some form of ordinance requiring an annual inspection of heating plants in dwelling houses of the classes mentioned above. In such buildings fires are frequently disastrous, and their source is usually in the basement.

FIRE PROTECTION IN STABLES FOR HORSES.

On Dec. 27, 1915, a fire occurred in a Lynn stable, in which 49 horses were destroyed. The insurance on them was about \$15,000. The stable was practically a two-story building, 225

feet long, with the horses on the second floor. At one end of the building the second story was on a level with the yard, and the only exit was at this end. If there had been an exit at the other end most of the horses could have been saved. In conjunction with Dr. Rowley of the Society for the Prevention of Cruelty to Animals the Commissioner petitioned the Legislature for legislation that would protect horses stabled above the first floor. The following measure was enacted:—

CHAPTER 158, GENERAL ACTS OF 1916.

AN ACT TO REQUIRE FIRE PROTECTION IN STABLES FOR HORSES AND MULES.

Be it enacted, etc., as follows:

SECTION 1. No horse or mule shall be stabled on the second or any higher floor of any building unless there are two means of exit therefrom, at opposite ends of the building, to the main or street floor.

SECTION 2. This act shall not apply to stables equipped with an automatic sprinkler system.

SECTION 3. Any violation of this act shall be punished by a fine of not more than two hundred dollars.

SECTION 4. This act shall take effect on the first day of January, in the year nineteen hundred and seventeen. [*Approved April 26, 1916.*]

INFLAMMABLE FLUIDS.

Sale of Gasoline in Boston Harbor.

In Boston Harbor are very many boats propelled by gasoline engines, and used for pleasure or in the off-shore fisheries. Prior to 1911 these boats took on gasoline without restriction at any point along the water front. This practice created a very great fire hazard. In 1911 the department having jurisdiction, established regulations forbidding the delivery of gasoline to power boats along the water front, and requiring that it should be purchased from gasoline vessels stationed in the harbor, at some location assigned by the harbor master. These gasoline vessels were licensed under these regulations. They obtained their gasoline and kerosene by means of supply boats that were supplied at certain points on the water front. Gradually, enforcement of the regulations ceased, and when the Fire Prevention Commissioner took office, gasoline was being sold

and delivered quite freely from the wharves. He re-established, with some changes, the regulations on Jan. 1, 1915, and they are being well observed by the owners of supply boats.

These gasoline vessels are located a safe distance off Fish Pier; two are located off East Boston, and two others in Cow Pasture Bay. With one or two exceptions the gasoline vessels are old hulks. The regulations define the manner in which they shall be anchored and maintained; the license limits the amount of gasoline and kerosene that shall be carried. Thus the regulations for the sale of gasoline in Metropolitan waters have very largely removed the danger of gasoline fires at the wharves. In the main, the owners of gasoline boats have lived up to the regulations.

This system for delivering gasoline to power boats is a great improvement on the old system of indiscriminate sale at the wharves, but there are objections to the present system, — the gasoline vessels are not attractive objects; they may to some extent interfere with navigation; and there is the remote danger that in a storm, or as the result of collision, the gasoline may flow over the water. A more desirable plan would be to build a cement station at some proper point on the shore of the harbor, and require gasoline to be purchased at that station. Such a station might be constructed so that sections could be leased to companies or individuals desiring to engage in the business, or the entire location might be leased to one concern, — perhaps, if public policy did not prohibit, to the concern that would pay the highest rental. Such a system would be safer, and would be more in keeping with the proper management of a great harbor. The concerns that are licensed to sell gasoline in Boston Harbor would like some such arrangement. The Fire Prevention Commissioner brought the matter to the attention of the Directors of the Port of Boston. That Board recognized the need of a change, but did not see its way clear to erect the station desired. The matter is still under consideration, and its solution may require action by the Legislature.

When the regulations governing the sale of gasoline in harbors were prepared, it was assumed that the authority of the Commissioner extended only to the sellers of gasoline; as a

result, those regulations made no attempt to improve conditions on the power boats.

On Feb. 26, 1915, the power boat "Mary C. Santos" commenced to take on gasoline from the "Smith Tuttle," one of the licensed gasoline boats. Suddenly there was an explosion that seemed to originate below the deck of the "Santos." The explosion lifted the deck of the "Santos," caused the schooner to sink, and destroyed the lives of three men. The gasoline boat was only slightly damaged. An investigation conducted by the Boston Fire Commissioner at the request of the Fire Prevention Commissioner made it clear that the tragedy was due to poor conditions on the power boat. The Fire Prevention Commissioner called a conference to which were invited representatives of the oil companies, the harbor master, and Deputy Chief Taber of the Boston Fire Department. It was agreed that the explosion on the "Santos" was due to an accumulation of gasoline vapors in the hold that had been set off by a light or fire in the hold. The harbor master and Deputy Chief Taber were appointed a committee to suggest new regulations, for the vessels selling gasoline, that would prevent explosions like that on the "Santos." The following regulations were suggested by them, approved by the oil experts, and established by the Commissioner:—

(a) All motor vessels having gasoline tanks below deck shall have a filler pipe connected directly with the tank, the upper end of which shall be flush with the deck, connected with a deck plate, and fitted with a screw cap.

(b) All motor vessels, while taking gasoline into their tanks, shall have all lights extinguished, and all hatchways, companionways, skylights and windows closed.

It is now the duty of the gasoline vessels, before delivering gasoline to a power boat, to see that it is in conformity with these regulations.

Since the tragedy on the "Mary C. Santos" the Attorney-General has stated as his opinion that "the provisions of law vest in the Fire Prevention Commissioner authority to make reasonable regulations governing the use of gasoline within the Metropolitan Fire Prevention District, whether the use of the

gasoline is upon land or upon water." That opinion will enable the Fire Prevention Commissioner to require reasonably safe conditions on power boats that are within his district.

Anchorage of Gasoline Boats.

In another way the use of gasoline creates danger in Boston Harbor. Recently the Fire Commissioner of Boston made the following report to the Fire Prevention Commissioner: —

I respectfully report that a condition exists in the vicinity of Commercial Wharf which constitutes an absolute hazard to life and property.

Located at what is known as the Eastern Packet Wharf are moored during the day and night hundreds of motor boats, containing all the way from 50 to 2,000 gallons of gasoline. These boats are owned and used mainly by fishermen who are very careless in matters pertaining to smoking, cooking, etc., around the boats. Surrounding this wharf are freight, mercantile and manufacturing houses, which are exposed to considerable danger. Recent fires on several of these boats, and especially on August 21, when a life was lost on a boat owned by John Hogan which contained about 1,000 gallons of gasoline, have made it necessary to make an investigation, from which it has been learned that the amount of gasoline carried in these boats at this location makes it one of the worst hazards along the water front.

The fire of August 21, which the report mentions, was caused by dropping a match into a gasoline tank. The danger is that in so great an assemblage of gasoline boats the fire may become general, or may, under favoring conditions, extend to the buildings along the water front. The condition described is not peculiar, except in extent, to the vicinity of Commercial Wharf. To a less extent it exists near all the bridges, and here and there along the water front. Again, the Directors of the Port and the harbor master were consulted, and it was their unanimous opinion that the gasoline boats now anchored near Commercial Wharf should be anchored in some less hazardous locality, and the basin just beyond the Fish Pier was suggested. The matter is now under consideration.

Transportation of Gasoline through Boston.

1. In the light of accidents that had happened, and after conferences with railroad officials, it was considered necessary to incorporate the following sections in the gasoline regulations.

17. No vehicle engaged in the business of transporting any volatile inflammable fluid over a public way in any city or town of said district, in quantity exceeding 25 gallons, shall approach nearer than 3 feet to any rail of a street railway, unless it become necessary to do so for the purpose of passing another vehicle or an obstruction, or for the purpose of avoiding an accident, or on account of insufficient space in the street. Before approaching nearer to said rail the person in charge of the vehicle shall look towards the rear, and hold out his arm so that it may be plainly seen by persons in charge of vehicles behind him that he intends to turn from the path in which he is proceeding.

18. At cross streets no vehicle transporting volatile inflammable fluids, in the quantity above mentioned, shall enter upon car tracks until it has been brought to a full stop, and until the person in charge of said vehicle has satisfied himself that it is safe to enter upon said tracks. This shall not apply to any automobile or motor truck that is not engaged in the business of transporting volatile inflammable fluids.

2. During the holiday season of 1915-16 arrangements were made with the oil companies not to send gasoline wagons through the congested streets of Boston during the hours when the congestion existed. The oil companies kept the agreement faithfully, with the same fine regard for the public welfare that they have manifested in all their dealings with the Fire Prevention Commissioner.

3. Early last March, in the city of Detroit, a railroad tank car containing gasoline began to leak, and the gasoline flowed into the sewer. The result was a terrible explosion that destroyed a large amount of property, and hazarded life. The Fire Prevention Commissioner sent accounts of this accident to heads of fire departments, with directions for handling a leaking gasoline car. In response to his letter he received from the Fire Commissioner of Boston a communication calling his attention to the transportation of gasoline in freight cars over Atlantic Avenue, and containing this sentence: —

You are doubtless familiar with the means of transporting freight along Atlantic Avenue, between the North and South terminals. This freight transfer road crosses subways, tunnels and sewers in abundance; and an accident from leakage of gasoline, or casing head gasoline, in the vicinity of Dewey Square or State Street, might cause tremendous loss of life or property.

The warning seemed a wise one, and the Fire Prevention Commissioner at once took the matter up with the railroads and shippers. Without the necessity of issuing an order, arrangements have been made so that no more gasoline cars shall be transported over Atlantic Avenue except in case of necessity, with the special permit of the Commissioner, and under the supervision of the Fire Department.

EFFECT OF GASOLINE REGULATIONS.

Prior to 1914 the sale and use of gasoline and other volatile inflammable fluids was subject to very slight control in the Metropolitan District. Large tanks of gasoline were installed without permission and without supervision, and gasoline was kept in homes, stores, shops and factories in common kerosene cans, or even in glass bottles. The result was many gasoline fires. In May, 1914, the District Police established an excellent code of regulations. In the fall the Fire Prevention Commissioner adopted these regulations with such changes as experience showed to be necessary or the convenience of business required. Restriction is always distasteful, and complaints were heard of the attempt to guard the use of these dangerous fluids. The results would seem to prove the wisdom of the regulations. The number of gasoline fires throughout the Metropolitan District in 1914 was 104; in 1915 the number fell to 46.

CONSTRUCTION OF GARAGES.

In the construction of garages an attempt has been made to modify previous regulations, as far as reasonable safety would permit, for the purpose of conveniencing the public. Small private garages carry but little hazard. Under previous regulations, if made of wood, they must be situated at least 20 feet from the nearest wooden building; under present regulations

that distance is made 12 feet. Under previous regulations a license was needed for such garages; under present regulations, in the case of garages intended for not over two cars, if the Building Inspector certifies that the building conforms with the regulations of the Fire Prevention Commissioner, no more is required. It is the policy of the Fire Prevention Commissioner in the light of experience to modify gasoline regulations and all other regulations as rapidly as a regard for public safety will permit for the convenience of the public.

In the case of large public garages the conditions are altogether different. On account of the number of persons frequenting the garage, and the number of cars stored there, the hazard is very much increased. Within the fire limits the regulations require an absolutely first-class building in which there shall be no wooden construction. In thickly populated districts, even outside the fire limits, the Commissioner has favored insistence on the same kind of a building. A result of this is that public garages in the Metropolitan District to-day illustrate the very safest form of construction.

FUEL OIL.

The rapid development in the use of fuel oil as a substitute for coal in heating and power plants has made it necessary for the Commissioner to consider and determine under what restrictions it should be stored and used. At the present time there is pending a petition for permission to store 30,000 gallons under a high office building in Boston.

It has been necessary to consider not alone the restrictions under which fuel oil should be stored and used, but also petitions for the establishment of plants for distributing it. Its use is being introduced into the textile mills, and that would seem to necessitate that Lowell, Lawrence and other cities should be supplied from Boston. In 1915 the Mexican Petroleum Corporation sought permission to establish a large fuel oil plant in the city of Chelsea, on twenty acres of marsh land fronting on Chelsea Creek. Their plan was to erect at this place tanks for about 400,000 barrels of oil, which would be brought to Boston by water. From this plant the oil would be distributed throughout New England. With proper safe-

guards such a plant could be erected and maintained without hazard to the city of Chelsea. The mayor and the Chief of the Fire Department favored it. The Commissioner was in doubt, however, whether it would be wise to burden the upper and narrower parts of Boston Harbor with another fleet of oil vessels. The route of the vessels lay across the courses of two lines of ferryboats, and under three bridges. The matter seemed a broad and important one, on which expert opinion should be sought. The Commissioner invited the following officials to attend a conference: Councillors Hagan, Attridge and Ballantyne of the Boston City Council; Fire Commissioner Grady; Messrs. Cram and Walsh of the Boston City Planning Board; John N. Cole of the Industrial Development Board; Harbor Master Perry; Mr. Joslin, representing the Chamber of Commerce; and Edward F. McSweeney, chairman of the Directors of the Port of Boston. Fortunately, all these gentlemen were able to be present. Two questions were presented for their consideration: first, whether the petition of the Mexican Petroleum Corporation involved any special hazard to Boston Harbor; second, what locations in the Metropolitan District would be considered most desirable for future oil plants. Both these questions were discussed at length. On the first, it was the unanimous opinion of the conference that the establishment of the Mexican Petroleum Corporation's plant involves no special hazard to Boston Harbor, if the plant were provided with modern safeguards. The opinion was also freely expressed that in considering such petitions the Commissioner should be careful not to permit a striving for conditions of academic perfection to drive away important lines of business from Boston Harbor and the Metropolitan District. In answer to the second question it was agreed that the shores of the Neponset River on the south, and the shores of the Saugus River on the north, afforded unobjectionable sites for such plants. If a location nearer the heart of the district were sought, it was suggested that such a location might be found on the shores of the Mystic River in Somerville.

The Commissioner granted the petition of the Mexican Petroleum Corporation. A copy of the license and of the restrictions under which it was granted follows: —

Whereas, On the third day of May, A.D. 1915, the Mexican Petroleum Corporation petitioned the Board of Mayor and Aldermen of the City of Chelsea, situated within the Metropolitan Fire Prevention District of said Commonwealth, for a license to use a tract of land in said Chelsea, containing about twenty-two acres, and bounded westerly by Eastern Avenue, northerly by land now or formerly of Gerry *et al.*, northeasterly, easterly and southerly by Chelsea Creek, southerly again by lands of the Boston & Albany Railroad Company, and of the Commonwealth of Massachusetts, for the purpose of erecting thereon suitable tanks and structures for storing, treating and distributing petroleum and its various products;

And whereas, On the twenty-ninth day of November, A.D. 1915, the said Board of Mayor and Aldermen, acting under authority of the Fire Prevention Commissioner for said district, did, by vote, give the said petitioner leave to withdraw on its said petition;

And whereas thereafter, The said petitioner appealed from said act of the said Board of Mayor and Aldermen to the said Fire Prevention Commissioner:

I, John A. O'Keefe, duly appointed and qualified Fire Prevention Commissioner for the said District, by virtue of the authority conferred on me by law, do hereby grant to the said Mexican Petroleum Corporation, as far as in my power lies, the right to use said premises for the purpose of constructing thereon suitable tanks and other structures for storing, treating and distributing petroleum and its various products, for the term of one year. The right to use said premises as above set forth shall be exercised in the manner indicated on the plan marked "A," hereto appended, and in accordance with the conditions, restrictions and limitations contained in a certain memorandum marked "B," also hereto appended, except in so far as slight deviations from said plan and memorandum may be sanctioned by the Fire Prevention Commissioner. The said plan and memorandum are hereby made parts of this license.

JOHN A. O'KEEFE,

Fire Prevention Commissioner for the Metropolitan District.

MAY 10, 1916.

B.

MEMORANDUM.

Conditions, Restrictions and Limitations governing the Construction and Maintenance of a Plant in Chelsea Creek, in the City of Chelsea, for the Storage, Treatment and Distribution of Petroleum and its Various Products, under a License granted to the Mexican Petroleum Corporation by the Fire Prevention Commissioner, May 10, A.D. 1916.

1. During the year for which this license is granted, no refining of petroleum shall be carried on in said plant.

2. The size and location of tanks to be erected shall be in accordance with the plan herewith filed, marked "A," except as provided in the license.

3. The tank marked "Tank No. 1," on said plan, shall alone be used for the storage of naphtha or gasoline; all other tanks shall be used for the storage of fuel oil, with a flash point higher than 150° F.

4. Each tank shall be surrounded with a circular embankment of reinforced concrete, not less than 4 feet in height, and having a capacity not less than 5 per cent. greater than the tank to be protected.

5. In matters for which provision is not specifically made in this license and memorandum, the tanks shall conform in material and construction with the requirements of the National Board of Fire Underwriters.

6. Valves shall be installed in the pipes leading to and from said tanks, in a manner satisfactory to the Fire Prevention Commissioner.

7. Tanks shall be filled only by pipes entering over the top.

8. Manhole covers on the tops of the tanks shall be kept closed only by the weight of the cover.

9. Each tank shall be protected with the "Foam Extinguisher" system, constructed in a manner satisfactory to the Fire Prevention Commissioner.

10. The bulkhead, and any piers that may be constructed, shall be constructed with substantial piles and heavy planking, approved by the Fire Prevention Commissioner, and shall be covered with cement concrete not less than 3 inches in thickness.

11. All buildings erected on said premises shall be of first-class construction.

12. A substantial fence, of incombustible material, shall be built around said premises except on the water front.

13. No oil shall be kept or stored on said premises in cans, barrels, drums, or other similar containers, except for convenience in supplying the automobiles of the company.

These restrictions, and the plan filed with the city clerk of Chelsea, will prevent the development of the business along channels that may increase the fire hazard. An extension of the rights granted in this license can be obtained from time to time only by consent of the city government of Chelsea, or the Fire Prevention Commissioner, in the same manner in which the original license was obtained.

FIRE CONDITIONS IN SCHOOLHOUSES.

The Fire Prevention Commissioner has no control over the construction of schoolhouses. However dangerous the structural conditions may be, he has no authority to order changes. This is quite proper. In the interest of unity and simplicity

of administration, all authority to supervise the erection of new buildings, or to order changes in existing buildings, is vested in the District Police, except so far as authority is vested in local building commissioners or building inspectors. This prevents evasion of responsibility, and all the credit for safely constructed buildings, as well as all the discredit for unsafely constructed buildings, can be definitely placed. If the Fire Prevention Commissioner believes that structural conditions increase the likelihood of fire loss, he has endeavored to change them through the District Police or through local officials. But while the statute gives the Commissioner no authority over construction, yet it clearly makes it his duty to study construction, and if in his opinion circumstances require it, to advise officers of cities and towns, and to make suggestions to the General Court, looking to the improvement of laws, ordinances and by-laws relating to construction. His province in matters of construction, then, is advisory and not mandatory. Section 24 of the Fire Prevention Act (chapter 795 of the Acts of 1914) is as follows: —

It shall be the duty of the commissioner to study fire hazard and fire prevention and all matters relating thereto, to hear suggestions and complaints from all persons and from all cities and towns in the metropolitan district, to advise with the officers of such cities and towns, and from time to time to make suggestions to the general court and to the cities and towns looking to the improvement of the laws, ordinances, and by-laws relating to fire departments, construction of buildings, building or fire limits, use and occupation of buildings and other premises, protection of existing buildings, fire escapes and other life-saving devices, segregation and licensing of trades dangerous by reason of fire hazard, and all other matters relating to fire prevention and fire hazard.

In performance of the duties and obligations placed on him by this section, shortly after his appointment in the fall of 1914, the Commissioner called at the State House a conference of officials from cities and towns in the district to consider what action should be taken in the matter of wooden shingles. In further performance of those duties it seemed to him, in May, 1915, that he should conduct an investigation of the fire conditions existing in schoolhouses, public and private, throughout

the district. He had no inspectors to make this investigation for him; but section 4 of the Fire Prevention Act provided that he could delegate any inspection required under the act to the Head of the Fire Department, or to any other designated officer in any city or town in the Metropolitan District. It seemed best to the Commissioner to delegate that work to the person in charge of each school. A complete list of public and private schools in the district was compiled, and a report blank containing 51 questions was sent to the person in charge of each school. Those questions were framed to disclose the height and construction of the building; the fire escapes and stairways; the fire drills; the proximity to the building of fire hazards; and, above all, the construction of the basement, and the extent to which it was isolated from the building above. By July the reports had all been received, and they are to-day on file in the Commissioner's office. As far as appears, this was the first attempt made in the Commonwealth to tabulate schoolhouse structural conditions with a view to fire dangers. To the Commissioner's surprise the reports disclosed in Metropolitan schoolhouses the conditions that have since become generally known. Public and private schoolhouses were alike defective, and the dangerous conditions existed more or less in all cities and towns. Under section 24 of the Fire Prevention Act, quoted above, the Commissioner at once commenced to communicate with those in charge of private schools, and later with school committees, and to "advise with" them as required by law. As has been stated above, he properly had no authority to order the correction of conditions, but it was remarkable how frequently his suggestions were put into practice in private and public schools alike. He had been corresponding with the director of a large private school in the district, and the day before the Peabody fire he received from this director a letter from which the following is quoted:—

Our hall, I see, naturally suggests to you a fire hazard. Well, this hall is seldom used, and when used can be most easily emptied. There are two large exits about 8 feet wide leading from it.

On the same day the Commissioner answered as follows:—

There is a danger from the hall on the third floor. I note that it is not frequently used, but fires have a way of occurring at the most inopportune moments. As to the rest of the building, I am not certain from your letter whether the ceiling of the basement is wire lath and cement plaster; if it is, and the stairway is protected, that is splendid work.

Fires in school buildings are quite common; occasionally they end in tragedies, and I feel that we should do everything possible to render such tragedies as nearly impossible as human effort can. I am pleased to note that in this view you wholly agree with me, and that I have your earnest co-operation.

The Peabody schoolhouse fire occurred Oct. 28, 1915. Peabody is not in the Fire Prevention District, and accordingly there was no report in the Commissioner's office on this particular schoolhouse. It was at once apparent that the Peabody tragedy was due to structural conditions which the reports made to the Commissioner had shown to be general throughout his district. He was spurred to renewed work in the attempt to have them corrected.

The great Boston fire of 1872 occurred November 9. That date had been observed as Fire Prevention Day in 1914. In 1915 it seemed that the wisest and most profitable way to observe Fire Prevention Day would be by a conference of officials of the cities and towns in the Commonwealth, and of citizens distinguished in the various lines of work that had to do with schools and construction, who should consider the present conditions of Massachusetts schoolhouses, and recommend methods for safeguarding them. The calling and direction of such a conference appeared to be in a special manner the duty of the Fire Prevention Commissioner. For such a conference there could be no more fitting place than Faneuil Hall. The Governor gave the plan his hearty support. In the few days that were available invitations were prepared and sent to officials and private citizens whose assistance would be of service in the work that was to be done.

The conference was opened by Governor Walsh, with the following brief address:—

MR. O'KEEFE, LADIES AND GENTLEMEN:—I want to thank every one here for evincing this interest in a great public duty. The obligation

rests upon us all, and particularly upon the government, to prevent waste of property and destruction of human life. The vigilance, the foresight that are so necessary and so essential for the protection of life and of property from the invasions of a foreign foe are just as essential and just as important for the prevention of loss of property and of life from a foe within, and there is no more deadly foe to human life or to property than fire. Therefore, we do well as citizens to come together to see in what manner, and in what way, we can plan and we can devise methods and ways of preserving human life, and saving the property of our fellow citizens from loss and destruction through the waste by this deadly enemy to humanity and to human life, — namely, fire.

It is an evidence of public spirit that so many have come from various parts of the State to participate in this discussion, and by their presence to emphasize to the whole community the importance of this subject, and the necessity of every single community in the State being put to work to prevent every possible loss that may come in the future through fire to either property or to life. And I think our obligation is all the more serious when we come to the duty which we owe to protect the lives of the young children while performing the duties of preparing themselves for citizenship. The State requires attendance at school by its young for the purpose of inculcating into their lives the necessary knowledge and equipment essential for good citizenship. It insists that its children, who are to be the future citizens, the future statesmen, the future soldiers, the future mothers, shall know the history of our country, the history of other countries, and by comparison understand how much more valuable our institutions are, — to know the sacrifices which have been made for the establishment of the liberties which we enjoy here.

In forcing these young children into the schools for this work of preparing for citizenship, and also of preparing themselves to take advantage of the opportunities of life when they reach a more mature age, it seems to me we have a special obligation, because attendance at school isn't like attendance at an amusement, it is a requirement which the State places on all parents and on all children, and we ought, therefore, to see that these most precious of all our jewels — the children of to-day, the men and women of the future — should be guarded as we would guard the most valuable jewel that any one of us possesses, for they are the jewels of the State and of the nation. They are its most valuable assets, for from among them must come the citizens who are to solve the problems of the future, and who are to defend the liberties which we enjoy.

So our task to-day is an inspiring one, and I am very glad to find so many here, and to find the large number of public-spirited men, representing here the activities of the communities, who have prepared papers and who have expressed a willingness to participate in this discussion. I want to thank them in the name of all the people of the State, for the State is always grateful to public-spirited men who give of their efforts

and their lives to the solving of some of the problems of their fellow men. I am especially grateful to them for their willingness to help suggest a way and means of doing even more than we have to-day, and of impressing upon this whole community the tremendous importance of safeguarding and protecting in every possible way the lives of others, — the lives of our children.

I therefore wish this conference Godspeed and success, and I pray that the result of your deliberations may mean new efforts upon the part of our Commonwealth to do even more than it has ever done in the past to protect property, and safeguard and preserve the lives of our fellow citizens, especially of our children.

After the Governor's address the conference chose the Fire Prevention Commissioner chairman. Addresses on different phases of schoolhouse conditions and needs were then made by the following persons: —

David Snedden, State Commissioner of Education.

Frank Irving Cooper, associate architect for the Russell Sage Foundation.

Prof. C. B. Breed, Massachusetts Institute of Technology.

Gorham Dana, Manager of Underwriters' Bureau of New England.

Dr. Thomas L. Harrington, Director of Hygiene in Boston Schools.

R. Clipston Sturgis, architect, and former chairman of Boston Schoolhouse Commission.

Lyon Weyburn, Legislative Counsel for Boston Chamber of Commerce.

After the addresses and a discussion, it was voted to appoint a committee who should adopt measures to insure the safety of children in Massachusetts schools. That committee, known as the Faneuil Hall Committee, was finally constituted, as follows: —

John A. O'Keefe, Fire Prevention Commissioner, Chairman.

Jesse A. Barrett, Chief of Peabody Fire Department.

Prof. C. B. Breed, Massachusetts Institute of Technology.

Dennis E. Carey, Chief of Lawrence Fire Department.

Frank Irving Cooper, associate architect for Russell Sage Foundation.

Gorham Dana, Manager, Underwriters' Bureau of New England.

John Grady, Fire Commissioner of Boston.

Dr. Thos. F. Harrington, Director of Hygiene in Boston Schools.

George L. Johnson, Chief of Waltham Fire Department.

William H. Sayward, secretary of Boston Master Builders Association, and chairman of Special Commission to Frame State Building Code.

David Snedden, Commissioner of Education.

R. Clipston Sturgis, architect, and former chairman of Boston Schoolhouse Commission.

John O. Taber, Senior Deputy Chief of Boston Fire Department.

Franklin H. Wentworth, secretary, National Fire Protection Association.

Lyon Weyburn, Legislative Counsel for Boston Chamber of Commerce.

William Brophy, secretary, Fire Chiefs Club of Massachusetts.

Nathaniel Bunker, Chief of Cambridge Fire Department.

Hiram L. Dorman, Schoolhouse Commissioner of Springfield.

Joseph P. Glavin, expert sprinkler worker.

George C. Halcott, Superintendent of Public Buildings, Worcester.

H. P. Jennings, President of Boston Central Labor Union.

Edward N. Kelly, expert wire lather.

Chas. A. Logue, builder, and formerly of Boston Schoolhouse Commission.

Joseph McGuinness, architect.

James McNamara, expert electrician.

Edward C. Minohan, Chief of Marlborough Fire Department.

James Moriarty, expert sheet metal worker.

Sewall M. Rich, Chief of Somerville Fire Department.

W. C. Shepard, Chief of Pittsfield Fire Department.

T. G. Toomey, in charge of fire protection in Filene's store.

This committee met at the State House, and elected the Fire Prevention Commissioner chairman. Many meetings were held through November and December, and the matter of safeguarding existing schoolhouses was very carefully considered. There appeared to be two possible lines of action: first, to prepare and distribute for the information of school authorities and municipal officials a circular on safeguarding existing schools, and second, to initiate legislation. It was decided to prepare the circular, but in regard to legislation to wait, in the expectation that a bill might be introduced by some member of the General Court or by some public body. The circular, entitled "Safeguarding Schoolhouses from Fire," was prepared by the Faneuil Hall Committee, and, as proper fire prevention work, was published and distributed by the Fire Prevention Commissioner. Late in January, 1916, when it was seen that no legislation for safeguarding schoolhouses had been introduced into the Legislature, the Faneuil Hall Committee met again. It was voted to prepare a bill that should aim in a

practical and comparatively inexpensive way to protect the lives of children in schools. In preparing this bill the committee started with the premises that most schoolhouse fires originate in the basement, and that if the fire and smoke can be kept in the basement for a reasonable time the children will be able to pass out by the usual exits. A copy of that bill in amended form is annexed to this report as Appendix III. It was referred by the Legislature of 1916 to a special recess committee, who are to report to the General Court in 1917.

The Faneuil Hall Committee are wedded to no particular bill or form of protection. With general public support they have contended that the lives of the children in the schools should be made reasonably safe.

Schoolhouse fires are regrettably frequent in Massachusetts. In the year 1915 there were twenty-six such fires in the State; in 1914 there were thirty-three. From September, 1915, to July, 1916, there were twelve schoolhouse fires in the Metropolitan District alone. With favoring circumstances any one of these fires might have developed into a tragedy. The lives of Massachusetts school children should no longer be staked on a chance.

FIRE LOSS AND INSURANCE.

There can be no question that the burden placed on the community by fire losses is vastly increased by the manner in which insurance is placed, and by the extent to which insurance is given. Over-insurance is an incitement to arson, or, at the very least, to carelessness in protecting property. The commissions paid brokers, and the manner in which those commissions are paid, lead to over-insurance, and to insurance where the hazard should prohibit all insurance. Failure on the part of the broker to inspect the risk, permits over-insurance and unduly hazardous insurance. If insurance were refused on property unless fire conditions were improved many losses would be avoided.

The present method of adjusting fire losses is vicious. The adjusters are under the control of the insured and the company. Imagine a case where the insured carried insurance to the amount of \$250,000. He has a \$5,000 fire, but wants \$25,000. He intimates that, if he is not favored, he will trans-

fer his business to another company. What will be the natural effect on the agent, and even on the company?

It is the opinion of the Fire Prevention Commissioner that legislation is needed along the following lines:—

1. Make the fees of agents in part contingent on their success in avoiding losses.
2. Limit the percentage of premiums to be used by any company in getting business.
3. Require by law that all insurance adjusters should be appointed by the Insurance Commissioner of the Commonwealth, assigned by his office to adjust losses, and paid salaries out of assessments made on the companies on some equitable basis.
4. Require personal inspection of risks by the agent. If it be impracticable on account of the expense to do this in all cases, require it in cases where the amount of the policy exceeds a certain sum. There is little doubt that the additional expense caused by such inspection would be much more than made up in decreased losses.

It is further the opinion of the Fire Prevention Commissioner that legislation along these lines would rescue the business of fire insurance from a bad situation, and would not meet with great opposition.

In the present uncertainty as to the future form of the Fire Prevention Department in Massachusetts, it has seemed to the Commissioner best that he should not present to the coming Legislature bills to accomplish these reforms.

HOUSE BILL No. 1750 (1915).

House Bill No. 1750, which was referred to a recess committee this year, proposes to make fire prevention a part of a State building department, to re-enact the fire prevention laws practically as they stand, and to transfer to the State Building Department the personnel of the present Fire Prevention Department, making the Fire Prevention Commissioner one of four deputies appointed by and subject to a State building commissioner. This proposition stands or falls with the assumption that the fire loss is mainly due to defective construction, or defective maintenance of proper construction. As a matter of fact, this assumption is not true. During the year 1915 the entire number of fires causing loss in the Metropolitan

District was 9,109; of these there were due to defective construction, or defective maintenance of proper construction, only 274, divided as follows: —

Chimney,	187
Wiring,	51
Overheated steam pipe,	10
Fireplace,	8
Furnace,	7
Gas pipe,	4
Construction,	3
Smoke pipe,	2
Gas fixture,	1
Firebox,	1

The great majority of fires are caused by poor housekeeping; they arise from matches, ashes, rubbish, improper use of fat and oils, spontaneous combustion, smoking, and so forth. These fires must be checked, not by proper construction, but by education of the community in the broadest sense, by judicious regulations, by insurance legislation, by prosecution of men guilty of arson. For this work a good builder might have no qualifications.

As far as construction enters into fire prevention it should be done or required under the supervision of the Building Department, at the request, possibly, of the Fire Prevention Commissioner.

Fire prevention work is new, and its methods have not yet been determined. It requires much initiative on the part of the official in charge. Make that official a subordinate of a building commissioner, and the incentive for initiative is largely taken away; the work will become routine; the department will be carried along by the larger department of which it is a part, and will not feel the vital necessity of showing results that exists to-day.

It seems by all means desirable that fire prevention should be worked out as a separate problem, and not merged, in its present undeveloped condition, with the administration of a State building department.

The expense of the department during the present year is 1.41 cents for each person in the Metropolitan District.

APPENDICES.

APPENDIX I.

CITIES AND TOWNS IN THE METROPOLITAN FIRE PREVENTION DISTRICT.

The following is a list of the cities and towns included in the Metropolitan Fire Prevention District, with the population according to the census of 1915:—

CITIES.

Boston,	745,439
Cambridge,	108,822
Chelsea,	43,426
Everett,	37,718
Lynn,	95,803
Malden,	48,907
Medford,	30,509
Melrose,	16,880
Newton,	43,113
Quincy,	40,674
Revere,	25,178
Somerville,	86,854
Waltham,	30,154
Woburn,	16,410
	<hr/>
	1,369,887

TOWNS.

Arlington,	14,889
Belmont,	8,081
Brookline,	33,490
Lexington,	5,538
Milton,	8,600
Reading,	6,805
Rockland,	7,074
Saugus,	10,226
Stoneham,	7,489
Watertown,	16,515
Winchester,	10,005
Winthrop,	12,758
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	141,470

Total population,	1,511,357
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APPENDIX II.

MEMBERS OF THE FIRE PREVENTION DEPARTMENT IN
THE METROPOLITAN DISTRICT.

FIRE PREVENTION DEPARTMENT FOR THE METROPOLITAN DISTRICT.

Commissioner,	John A. O'Keefe.
Deputy Commissioner,	Michael A. Murphy.
Secretary,	Harry E. Lake.

HEADS OF FIRE DEPARTMENTS IN THE METROPOLITAN DISTRICT.

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Arlington, . . .	Chief Walter H. Pierce, . . .	1003 Massachusetts Ave.
Belmont, . . .	Chief John F. Leonard, . . .	Leonard St.
Boston, . . .	Commissioner John Grady, . . .	40 Bristol St.
	Chief Peter F. McDonough, . . .	Mason St.
	Senior Deputy John O. Taber, . . .	Fort Hill Sq.
	Junior Deputy Daniel F. Sennott,	Winslow and Dudley sts., Roxbury.
District 1, . . .	John W. Godbold, . . .	Paris St., East Boston.
District 2, . . .	Allan J. Macdonald, . . .	Main St., Charlestown.
District 3, . . .	Stephen J. Ryder, . . .	Pittsburgh St., South Boston.
District 4, . . .	Edward J. Shallow, . . .	Bullfinch St.
District 5, . . .	William Coulter, . . .	Mason St.
District 6, . . .	Frank Jordan, . . .	Dorchester St., South Boston.
District 7, . . .	Peter E. Walsh, . . .	Warren Ave.
District 8, . . .	Wm. J. Gaffey, . . .	Tremont St., Roxbury.
District 9, . . .	Joseph H. Kenney, . . .	Dudley St., Roxbury.
District 10, . . .	Walter M. McLean, . . .	Harvard St., Dorchester.
District 11, . . .	Henry A. Fox, . . .	Harvard Ave., Allston.
District 12, . . .	Michael T. Mulligan, . . .	Centre St., Jamaica Plain.
District 13, . . .	Michael Kennedy, . . .	Cor. Washington and Poplar sts., Roslindale.
District 14, . . .	Maurice Heffernan, . . .	Peabody Sq., Dorchester.
District 15, . . .	Joseph A. Dolan, . . .	Cor. Harvard Ave. and Winthrop St., Hyde Park.
Brookline, . . .	Commissioner W. W. Estabrook, . . .	340 Washington St.
	Chief Geo. H. Johnson, . . .	340 Washington St.
Cambridge, . . .	Acting Chief James M. Casey, . . .	Inman Sq.

HEADS OF FIRE DEPARTMENTS IN THE METROPOLITAN DISTRICT — Con.

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Chelsea,	Chief David M. Hudson,	307 Chestnut St.
Everett,	Chief Joseph T. Swan,	Broadway.
Lexington,	Chief Edward W. Taylor,	5 Main St. .
Lynn,	Chief Edward E. Chase,	Cor. Baker and Franklin sts.
Malden,	Commissioner John H. Hannan,	Mountain Ave.
	Acting Chief John T. Nicolls,	388 Main St.
Medford,	Chief Charles M. Bacon,	1 South St.
Melrose,	Chief Joseph Edwards,	576 Main St.
Milton,	Chief J. Harry Holmes,	Danton Ave.
Newton,	Chief W. B. Randlett,	27 Willow St.
Quincy,	Chief Faxon I. Billings,	Quincy Ave.
Reading,	Chief O. O. Ordway,	11 Pleasant St.
Revere,	Chief A. L. Kimball,	Broadway.
Rockland,	Chief Fred Chapman,	Union St.
Saugus,	Chief Ernest Stuart,	Woodbury Ave.
Somerville,	Chief Sewall M. Rich,	261 Medford St.
Stoneham,	Chief A. J. Smith,	1 Tidd St. .
Waltham,	Chief Geo. L. Johnson,	Moody St.
Watertown,	Chief John W. O'Hearn,	99 Main St.
Winchester,	Chief David H. DeCourcy,	Mt. Vernon St.
Winthrop,	Chief F. W. F. Woolcott,	31 Pauline St.
Woburn,	Chief Frank E. Tracy,	Winn St.

BUILDING COMMISSIONERS AND INSPECTORS IN THE METROPOLITAN DISTRICT.

Arlington,	William Gratto.
Belmont,	James R. Logan.
Boston,	Commissioner Patrick O'Hearn.
Brookline,	Commissioner E. Lyon.
Cambridge,	Jeremiah Downey.
Chelsea,	James C. Denning.
Everett,	George H. Wood.
Lexington,	William Gratto.
Lynn,	Commissioner George A. Cornet.
Malden,	C. George W. Bagge.
Medford,	Frank Blackett.
Melrose,	William S. Allen.
Milton,	G. E. Burt.

BUILDING COMMISSIONERS AND INSPECTORS IN THE METROPOLITAN
DISTRICT — Con.

Newton,	.	.	.	.	.	Commissioner Walter R. Forbush.
Quincy,	.	.	.	.	.	Warren S. Parker.
Reading,	.	.	.	.	.	Robert E. Parker.
Revere,	.	.	.	.	.	William H. Graham.
Rockland,	.	.	.	.	.	James F. Coady.
Saugus,	.	.	.	.	.	Daniel Willis.
Somerville,	.	.	.	.	.	Commissioner Geo. L. Dudley.
Stoneham,	.	.	.	.	.	Albert Smith.
Waltham,	.	.	.	.	.	Thomas Lally.
Watertown,	.	.	.	.	.	William H. Benjamin.
Winchester,	.	.	.	.	.	Maurice Dineen.
Winthrop,	.	.	.	.	.	Charles F. Hargrave.
Woburn,	.	.	.	.	.	Henry Macksey.

APPENDIX III.

AN ACT TO DEFINE THE TERM "SCHOOLHOUSE" AND
RELATIVE TO THE CONSTRUCTION OF SCHOOLHOUSES.

Be it enacted, etc., as follows:

SECTION 1. The term "schoolhouse" when used in this act shall include all buildings used wholly or mainly for instruction at public or private schools, admitting pupils of primary, grammar or high school grades or their equivalent.

SECTION 2. The requirements herein set forth shall be put into effect before the first day of September, nineteen hundred and seventeen: *provided, however*, that the judge of the probate court for the county in which any schoolhouse is situated may on the application of the municipality, person, or corporation having the control of such schoolhouse approve other plans or materials that will in his opinion adequately safeguard the lives of the children in said schoolhouse.

SECTION 3. In schoolhouses not exceeding one story in height and containing more than one school room, if the heating apparatus be located in the basement, the ceiling of the basement, if constructed of combustible material, shall be protected with metal lath and cement plaster at least three quarters of an inch in thickness, or its equivalent; all spaces under walls and partitions and over girders, around heat and vent pipes, and around stairways, shall be thoroughly fire-stopped with brick in mortar, or its equivalent; and self-closing fire doors shall be installed at the top or bottom of each stairway leading from the basement to the floor above. No provision in this act shall be construed to apply to portable schoolhouses.

SECTION 4. In schoolhouses that exceed one story in height the said basement shall be cut off from the floor above in the following manner: the ceilings, underside of stairways and landings, if constructed of combustible material, shall be covered with metal lath and cement plaster, at least three quarters of an inch in thickness, or its equivalent; all spaces under walls and partitions and over girders, around heat and vent pipes, and around stairways, shall be thoroughly fire-stopped with brick in mortar, or its equivalent; and self-closing fire doors shall be installed at the top or bottom of each stairway leading from the basement to the floor above.

SECTION 5. In schoolhouses exceeding one story in height, if not of fireproof construction, where there are stairs or stairways connecting the first floor with the basement, the entire basement and all rooms above the basement used for manual training or laboratories shall be equipped

with automatic sprinklers, either wet or dry systems, provided with an adequate and constant water supply, and installed in accordance with the standard regulations adopted by the district police. Such sprinkler systems shall be adequately protected against freezing, and shall be kept in commission and under pressure whenever the building is occupied for school purposes. Where basements are equipped with automatic sprinklers, as provided in this section, the self-closing doors for basement stairways, as provided in sections three and four, need not be fire doors.

SECTION 6. In schoolhouses containing more than one room, partitions of wooden sheathing shall not be allowed in the basement, unless they be covered with metal lath and cement plaster, or its equivalent; and if heating apparatus be located in a basement that is not of fireproof construction such apparatus shall be separated from other parts of the basement by fireproof partitions, the openings in which shall be equipped with self-closing fire doors.

SECTION 7. In all schoolhouses, corridors leading to two or more exits shall be divided by a cross partition equipped with self-closing double swinging doors.

SECTION 8. Rooms situated in the attic shall not be used for class room purposes unless such rooms open on adequately lighted corridors that have two free and widely separated stairways leading to the exits from the building.

SECTION 9. In the city of Boston it shall be the duty of the building commissioner and in other parts of the commonwealth it shall be the duty of the building inspection department of the district police, to enforce the provisions of this act.

SECTION 10. If any city or town, or any official or officials in any city or town whose duty it is to appropriate money for the construction of schoolhouses or to authorize such construction, or any person or corporation having control of a private school, refuses or unreasonably neglects to carry out the provisions of this act or such order as a judge of a probate court may issue in lieu of the provisions of this act, such city or town, such official or officials, or such person or corporation, upon information presented by the building commissioner in the city of Boston, and by the chief of the district police in other parts of the commonwealth, shall be liable to a fine not exceeding one thousand dollars. It shall be the duty of said building commissioner and of said chief of the district police to present information in such cases.

SECTION 11. The requirements of this act shall apply also to all schoolhouses hereafter erected, if not of fireproof construction.

SECTION 12. Cities and towns may incur debt, within the limit of indebtedness prescribed by chapter seven hundred and nineteen of the acts of the year nineteen hundred and thirteen, and payable within ten years, for the purpose of making alterations in schoolhouses already constructed, so as to comply with the provisions of this act.

THIRD ANNUAL REPORT
OF THE
FIRE PREVENTION COMMISSIONER
FOR THE METROPOLITAN DISTRICT,
MASSACHUSETTS.

FROM AUGUST 1, 1916, TO AUGUST 1, 1917.



BOSTON:
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The Commonwealth of Massachusetts.

TO HIS EXCELLENCY SAMUEL W. MCCALL, *Governor of the Commonwealth of Massachusetts.*

SIR: — The Fire Prevention Commissioner for the Metropolitan District herewith submits his third annual report.

Very respectfully,

JOHN A. O'KEEFE,
*Fire Prevention Commissioner
for the Metropolitan District.*

FIRE PREVENTION COMMISSIONER FOR THE METROPOLITAN DISTRICT.

THIRD ANNUAL REPORT.

RESULTS OF FIRE PREVENTION DURING 1916.

During the year 1916 the methods outlined in my previous report for checking and limiting fires were followed with increasing results. Inspections were regularly made in the city of Boston by the district chiefs, captains and lieutenants, and to a varying extent in the other cities and towns of the district. Reports of these inspections were forwarded to the office of the Fire Prevention Commissioner, and action was taken by him to correct the conditions disclosed in the reports. Inspection work is well performed in the city of Boston; in other cities and towns there is still much to be desired. The prevention of fire depends on the removal of the conditions that lead to fire, and the presence of those conditions can be learned only by inspection.

A great deal has been done towards limiting the disastrous effects of fires once started by the installation of automatic sprinkler systems throughout the district.

During the year 1916 the fire loss in Boston was reduced \$530,100 from the loss of the preceding year; throughout the rest of the district the loss of 1916 was \$363,800 less than the loss of 1915. This makes the total reduction in the district for the year 1916, \$893,900.

Not only has the loss by fire been checked, but to a very large extent the number of alarms. In 1914 the number of alarms throughout the district was 13,477; in 1916 the number of alarms was 10,568. Every alarm that calls out the fire department, whether there is a fire or not, entails considerable

expense on the city with the danger of accidents and the wear and tear of apparatus. The other day in the town of Lexington the department was called out on a needless alarm, and while out a serious fire occurred that obtained a headway which it would not have obtained had the department been in its houses. Within a few weeks in the city of Boston a part of the department was called out on a false alarm and met with a serious accident. For these reasons it has been considered very important to decrease as far as possible the number of runs.

The following table shows the loss and the per capita loss for the Metropolitan District as it is to-day made up during the years 1914, 1915 and 1916:—

Losses and Per Capita Losses in the Metropolitan District for 1914, 1915 and 1916.

	Loss for 1914.	Per Capita Loss for 1914.	Loss for 1915.	Per Capita Loss for 1915.	Loss for 1916.	Per Capita Loss for 1916.
Arlington,	\$32,200	\$2 27	\$11,400	\$0 77	\$12,600	\$0 81
Belmont,	26,000	3 42	27,400	3 40	2,200	25
Boston,	3,044,600	4 16	3,003,200	4 03	2,473,000	3 25
Brookline,	45,600	1 41	21,000	63	6,700	19
Cambridge,	201,400	1 86	207,200	1 90	330,300	3 00
Chelsea,	153,400	3 72	132,500	3 05	154,500	3 39
Everett,	67,200	1 82	68,200	1 81	23,600	61
Lexington,	26,700	4 95	12,100	2 18	19,200	3 36
Lynn,	445,400	4 71	185,700	1 93	119,900	1 23
Malden,	89,300	1 86	219,700	4 49	47,700	96
Medford,	100,600	3 47	91,200	2 99	31,100	97
Melrose,	27,300	1 64	15,600	92	8,400	49
Milton,	29,800	3 51	20,300	2 36	6,600	76
Newton,	65,700	1 51	112,300	2 60	41,300	94
Quincy,	74,000	1 89	80,600	1 98	63,100	1 49
Reading,	4,900	85	10,900	1 60	56,100	7 20
Revere,	51,000	2 14	38,400	1 53	59,000	2 22
Rockland,	104,900	15 00	12,900	1 82	21,300	3 00
Saugus,	43,500	4 63	16,400	1 61	4,300	39
Somerville,	225,800	2 66	72,600	84	112,000	1 26
Stoneham,	35,600	4 81	6,900	92	3,200	42
Waltham,	20,800	70	60,800	2 02	35,600	1 16
Watertown,	27,100	1 72	21,600	1 31	27,700	1 61
Winchester,	6,900	70	8,800	88	4,900	48
Winthrop,	17,100	1 40	30,700	2 41	76,300	5 73
Woburn,	96,900	5 97	311,500	18 90	168,500	10 10
Totals,	\$5,063,700	\$3 42	\$4,799,900	\$3 17	\$3,909,100	\$2 53
Metropolitan District out- side of Boston,	\$2,019,100	\$2 70	\$1,797,000	\$2 35	\$1,436,100	\$1 83

It will be noted how generally the per capita loss has fallen,—in some instances to very low figures. The per capita loss in the city of Boston has fallen from \$4.16 in 1914 to \$3.25 in

1916; in the district outside of Boston it has fallen from \$2.70 to \$1.83.

I have given the figures showing the decrease in the total number of alarms. The following table shows the decrease in the number of fires causing losses, excluding alarms where no loss followed: —

	1914.	1915.	1916.
Arlington,	35	23	18
Belmont,	9	13	10
Boston,	2,301	2,229	1,855
Brookline,	37	42	45
Cambridge,	264	262	226
Chelsea,	258	263	180
Everett,	61	64	44
Lexington,	10	14	8
Lynn,	319	242	193
Malden,	152	139	103
Medford,	63	57	52
Melrose,	40	25	19
Milton,	16	13	14
Newton,	110	113	87
Quincy,	84	85	44
Reading,	13	14	16
Revere,	68	66	59
Rockland,	14	10	11
Saugus,	25	29	14
Somerville,	109	122	109
Stoneham,	26	21	18
Waltham,	47	61	50
Watertown,	31	29	36
Winchester,	27	20	21
Winthrop,	25	33	18
Woburn,	25	36	38
Totals,	4,169	4,025	3,288

These facts indicate that the work of limiting the fire loss is being successfully done. In this connection it must be borne in mind that this reduction is coincident with a large increase in population, and an especially large increase in the number

of buildings and in the industries carried on throughout the district.

In the report of the Boston Board of Fire Underwriters for the year 1916 occurs the following sentence: "In the list of fires below there are several which occurred in buildings recently equipped by order of the Fire Prevention Commissioner which would without question have resulted very seriously had it not been for the effective operation of the sprinklers."

The work achieved by the Fire Prevention Department will be appreciated more fully if we consider the opinion of an expert on the reduction of the fire loss in January, 1915, about the time that the Fire Prevention Department began its work. In his report published at that time Commissioner Grady of the Boston Fire Department says: —

Notwithstanding the fact that there were approximately 36,000 inspections made during the year, and in spite of the publicity campaign conducted as to the causes and prevention of fire, there were 716 more alarms than in 1913.

This brings us face to face with the fact that the public, or that part of the public whom we have tried to reach, pay little attention to the advice, warnings and the constant publicity given to the subject by those having fire prevention and extinguishment in charge, consequently the next step is to get legislation under which penalties can be meted out to those whose carelessness causes a fire.

With the incoming motor apparatus and the high-pressure fire service the appliances for extinguishing fire will have about reached their limit of efficiency, so that it is to the prevention of fire that we must devote our energy if the disgracefully enormous losses are to be curtailed.

PREVENTION AND LIMITATION OF FIRES.

When hazardous conditions are reported by an inspecting officer the occupants maintaining those conditions are notified by the department at once of the correction desired. Usually prompt attention is paid to such notification. In cases where it is not, an order is issued giving a certain time within which the changes must be made. If the changes are not made within that time prosecution follows. It is a pleasure to say that there have been very few cases where prosecution has been necessary. From July 1, 1916, to July 1, 1917, 217 such orders requiring changes in the maintenance of premises have been issued.

The means used for checking the spread of a fire once started have been: first, to facilitate the approach of the fire department by obtaining suitable entrances, aisles, etc.; second, to compel the installation of extinguishers at proper places throughout the stores and factories; and third, to require the installation of automatic sprinklers. The most effective means of checking fires is undoubtedly the automatic sprinkler. From July 1, 1916, to July 1, 1917, sprinklers were ordered throughout 52 buildings; at the same time partial sprinkler equipment was ordered in 43 other buildings. The Commissioner has hesitated to require sprinkler installation except in urgent cases on account of the very great increase in the cost to the real estate owner. Not only has the material risen very much in price, but the cost of labor has also increased so that the total cost is from two to three times what it was in 1915. In view of these facts it has seemed to the Commissioner that he should order sprinklers only in cases of extreme urgency where loss of life was in question. Many difficulties attend the matter of ordering automatic sprinklers in the cities of the district; for example, if a street is paved it is not allowable to open it up for the sake of making water connections within five years. For that reason just before the pavement is laid it becomes necessary to make as thorough an inspection of the district as is possible, and then to order sprinklers in such buildings as may seem to be in need of them; and it becomes necessary to anticipate the needs of the ensuing five years. In such cases unless there is urgency it has been the policy of the Commissioner to require water connection with the main in the street from the real estate owner, and to leave the matter of sprinklers for some future time. That plan is apparently working well. Another serious embarrassment in ordering sprinklers is that in making leases the landlord places on the tenant the obligation of executing all changes and repairs required by State or city officials. Sometimes a building is reported for sprinklers when a lease has but a year or two to run. It becomes then a question whether to commit the serious injustice of placing the entire expense of sprinkler installation on a lessee who has so short a term for the enjoyment of the premises, or to run the risk of a fire in the meantime. Questions like these confront the Commissioner all the time.

HAZARDS OUTSIDE THE CONTROL OF THE COMMISSIONER.

A serious limitation on the power of the Fire Prevention Commissioner is contained in the last two lines of section 10 of the fire prevention law which provides that no sprinkler order shall apply to any building unless four or more persons live or are usually employed therein above the second floor. The result of this provision is that sprinklers cannot be ordered in a building that is not over two stories in height, or in one where four or more people do not live or work above the second floor. It excludes from his control many woodworking establishments and very many storehouses, some of them six or seven stories in height, for the reason that although employees are constantly going up and down in such storehouses no one can be said to be usually employed above the second floor. In the interest of fire prevention this limitation should be removed.

From Jan. 1, 1916, to July 1, 1917, taking into account fires in the city of Boston where the loss was \$10,000 or more, \$750,000 of that loss occurred in buildings within the jurisdiction of the Commissioner, \$2,430,000 occurred in buildings not within his control, and, in buildings where his authority is limited by the provision above stated, the loss in such fires amounted to \$1,810,000. It is apparent then that the fires in such buildings cause a very large proportion of the entire loss in the city of Boston, and that it is most desirable to give the Commissioner authority to protect such buildings against fire.

FIREWORKS.

This spring it was proposed by the Fire Commissioner of the city of New York to the officials of all large cities throughout the country to abolish the sale and use of fireworks throughout the present war. The sale and use of fireworks in the city of New York are not now allowed. It seemed to the Fire Prevention Commissioner that any action in this matter should affect the entire State, and he suggested to the committee having in charge House Bill No. 1996 to incorporate the following section: —

The governor, with the advice and consent of the council, shall have power by proclamation to prohibit or regulate the use of fireworks and firecrackers throughout the commonwealth at such times as he may deem the public interest may require. Such prohibition or regulation shall continue until revoked by the governor. Subject to such prohibition or regulation as may be proclaimed by the governor, the authority of cities, towns and officials under existing law to prohibit or regulate the use of fireworks and firecrackers shall not be abridged or affected by the provisions of this section.

That was done and power was given the Governor to prohibit the use of fireworks or firecrackers should he judge it wise.

FACTORY FIRES.

In my second annual report I stated that an attempt had been made to control factory fires through the co-operation of the labor unions. It is in the power of the Commissioner to forbid smoking in factories; but it seemed to him a better plan to stimulate the interest of the wage earners in the attempt to save other wage earners from losing their work. In that report I stated also that factory fires for the first five months in 1916 showed a decrease over the first five months of 1915 from 113 to 63. It is gratifying for me to be able to say that the records of the first five months of the present year show only 35 factory fires. Smoking is the common cause of factory fires, and the form in which most of them originate is this: a worker stands in front of a blower smoking a cigarette and some one in authority approaches, and in order to avoid detection the worker carelessly throws the cigarette into the blower. In the city of Lynn, especially, that has been reported as a cause of factory fires. I have no doubt it is equally so elsewhere. The remedy for that is an appeal to the conscience of the worker. The results of such an appeal made in 1915 have been so satisfactory that that method will still be followed. In the meantime in many factories up-to-date proprietors or managers are providing a properly safeguarded room where the men may smoke during the noon hour. This is to be recommended, not only for humanitarian reasons but also because it is a real step in the work of fire prevention.

CONTROL OF EXPLOSIVES IN 1917.

During the early months of 1917 the Commissioner caused an examination to be made of all magazines in the city of Boston in which explosives were kept. This examination was made by the Deputy Commissioner and was very thorough. It disclosed a great variation in construction and in care used in guarding the magazines. Later, a theft by certain boys in Roxbury of some sticks of dynamite forced upon the Commissioner the belief that the entire matter must be handled in a radical fashion. Governor McCall was very much interested in the work, and by the Governor and Council an appropriation was made that enabled the Commissioner to employ an explosive expert, Mr. N. Richardson, to make a further examination of every magazine in the entire district. In the outside cities and towns it was found that dynamite was kept even more carelessly than in the city of Boston.

No magazine would be proof against evil-disposed persons who desired to enter it, and who were fully prepared for that purpose. For that reason it seemed that the keeping of dynamite should be limited entirely to magazines that were guarded day and night. In the city of Boston there were 24 magazines; of these, the licenses were revoked for all but 5, where guards were maintained; outside the city of Boston there were 74 magazines, and these were reduced to 13, where guards were maintained.

In order to accommodate persons using small quantities of dynamite arrangements were made with the proprietors of guarded magazines in different localities to accept from them such small quantities of dynamite as they might have on hand. A careful account of the dynamite stored in these magazines by each person is kept by the proprietors of the magazines so that at any time it is possible for the Fire Prevention Commissioner, or any person to whom he has delegated the work, to visit the magazine and learn just who is keeping dynamite there. It is further arranged that the proprietors of guarded magazines shall receive dynamite from no person who has not a license to use it.

In this work of guarding high explosives the assistance of the

wholesale dealers has been of the greatest importance. Although the regulations have necessarily placed some restraint on their business they have cheerfully joined in and have made the reports desired by the Commissioner. They sell to no one who has not a license to buy.

In this way the storage and use of dynamite has been strictly regulated, and no doubt this regulation has contributed its share towards the freedom from dynamite outrages that the Metropolitan District has enjoyed during the past six months.

At the present time a standard form of construction for magazines and a standard lock to safeguard them are under consideration.

The railroad agents have also done their share by advising the heads of fire departments immediately in the different cities and towns of the arrival at their freight yards of consignments of explosives.

In order to show the fine spirit with which the contractors of Boston have entered into the plan to safeguard dynamite I desire to give a quotation from a meeting held by a committee of them April 10, 1917, and the names of the contractors constituting the committee: —

It was the sense of the meeting that every precaution be taken by the consumers of dynamite to protect the welfare of the Commonwealth, and that a concerted effort be made to co-operate with the Fire Prevention Commissioner in handling this particular problem.

Respectfully submitted,

HUGH NAWN, *Chairman,*

WILLIAM J. BARRY,

JOHN C. COLEMAN,

MARTIN J. FINN,

BERNARD MALONE,

RANSOM ROWE,

THOMAS F. WELCH,

E. L. WEBBER, *Dynamite Manu-
facturers' Representative,*

Committee.

SHIPMENT OF HIGH EXPLOSIVES FROM BOSTON HARBOR.

Throughout his term of office the influence of the Commissioner has been exerted against the shipment of high explosives from Boston Harbor. It did not seem to him that the increase in trade would justify the danger of great destruction of life and property that would be connected with the handling of such high explosives. He was confirmed in his view by the New Jersey explosions.

At the present time the only substance approaching high explosives that is shipped from the port of Boston is benzol, from a plant in Canada, that arrives at a certain time at the docks in East Boston. Notice is at once given by the railroads to the District Chief of the Boston Fire Department for that district, and under his direction the benzol is taken on lighters and loaded on a steamer from the outer side, in order to minimize the danger to wharf property.

EFFECT OF FIRE PREVENTION MEASURES ON INSURANCE.

The general effect of fire prevention measures is to lower the rate of insurance. That is done mainly through the installation of sprinklers. Three years ago sprinklers might be installed at a price that would recoup the proprietor the cost of installation in seven or eight years from lower insurance rates. To-day that is not so, and the sole object achieved by sprinklers is the greater safety of property and life. I am giving below a table that shows the percentage reduction in insurance rates allowed in Boston during the past year on buildings sprinklered throughout or in part.

PART OF BUILDING SPRINKLERED.	Insurance Reduction (Per Cent.).	Number of Buildings.
Throughout,	12½	5
Throughout,	15	27
Throughout,	20	52
Throughout,	22½	3
Throughout,	30	2
Basement,	2½	3

PART OF BUILDING SPRINKLERED.	Insurance Re- duction (Per Cent.).	Number of Buildings.
Basement,	5	14
Basement,	7½	1
Basement and sub-basement,	10	1
Basement and first floor,	5	2
Basement and first floor,	7½	1
Basement and first floor,	15	1
Basement and second floor,	5	1
Basement and fourth floor,	5	1
Basement and partial,	10	3
Partial,	7½	1
Partial,	5	1
No allowance made: —		
Throughout,	—	35
Partial,	—	37

In connection with the reduction in insurance rates it is well to remember that in Boston when a building is equipped throughout with a system of automatic sprinklers, thus reducing the insurance rate on the premises by 20 per cent., the proprietors of adjoining buildings are entitled to a reduction in their insurance rates amounting to 20 per cent. of the proportion of the rate imposed for exposure hazard from this building.

WATER-FRONT CONDITIONS IN BOSTON.

There is always the danger of a serious conflagration along the water front in the city of Boston. A great deal has been done to remedy that by forbidding the sale or delivery of gasoline and other inflammable fluids at the wharves to boats in the docks. The sale of such fluids has been limited to certain boats stationed in the harbor and maintained under strict conditions. Permission has been sought to deliver gasoline in tanks and barrels at the wharves, but the delivery of such tanks and barrels means the return of empties at the same places. It is said to have been empty tanks that caused the disastrous freight yard fire in Charlestown in March, 1916. For these reasons the Commissioner has refused to allow the de-

livery of gasoline even in drums and barrels. There is also the fact that the gasoline would be emptied from the drums and barrels by the pleasure or fishing boats into their tanks while lying at the wharves.

The present system is not wholly satisfactory, and it is hoped ultimately to establish a gasoline sales station either on an island in the harbor or at some point so situated that it will furnish no danger of fire and will convenience the boats.

IN GENERAL.

After a concerted effort for the regulation of hazardous trades, the protection of unsafe buildings, the improvements in maintenance, and the careful use of fire, evidence of satisfactory results are at hand and presage a large economic saving.

But this desirable effect of fire prevention depends to a large extent upon the willingness of the people to continue to co-operate and accept the decisions of the Commissioner, even though it means a moderate investment for the protection of property.

Oftentimes, as is illustrated by the reduction in exposure hazard due to the installation of automatic sprinklers, this expenditure will not only insure self-protection, but it will also greatly reduce the hazard of the neighboring buildings.

The Commissioner, therefore, asks for assistance towards the reduction of alarms, the reduction of fires, the reduction of loss, and finally the reduction of the cost of insurance.

The expense of the department for 1916 was $1\frac{1}{3}$ cents for each person in the Metropolitan District.

APPENDICES.

CITIES.

[illegible]

1,369,887

TOWNS.

Arlington,	14,889
Belmont,	8,081
Brookline,	33,490
Lexington,	5,538
Milton,	8,600
Reading,	6,805
Rockland,	7,074
Saugus,	10,226
Stoneham,	7,489
Watertown,	16,515
Winchester,	10,005
Winthrop,	12,758

141,470

Total population, 1,511,357

APPENDIX II.

MEMBERS OF THE FIRE PREVENTION DEPARTMENT IN
THE METROPOLITAN DISTRICT.

FIRE PREVENTION DEPARTMENT FOR THE METROPOLITAN DISTRICT.

Commissioner,	John A. O'Keefe.
Deputy Commissioner,	Michael A. Murphy.
Secretary,	Harry E. Lake.

HEADS OF FIRE DEPARTMENTS IN THE METROPOLITAN DISTRICT.

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Arlington,	Chief Walter H. Peirce,	1003 Massachusetts Ave.
Belmont,	Chief John F. Leonard,	Leonard St.
Boston,	Commissioner John Grady,	40 Bristol St.
	Chief Peter F. McDonough,	Mason St.
	Senior Deputy John O. Taber,	Fort Hill Sq.
	Junior Deputy Daniel F. Sennott,	Winslow and Dudley sts., Roxbury.
District 1,	Wm. E. Riley,	Paris St., East Boston.
District 2,	Allan J. Macdonald,	Main St., Charlestown.
District 3,	Stephen J. Ryder,	Pittsburgh St., South Bos- ton.
District 4,	Edward J. Shallow,	Bulfinch St.
District 5,	Albert J. Caulfield,	Mason St.
District 6,	Frank Jordan,	Dorchester St., South Bos- ton.
District 7,	Peter E. Walsh,	Warren Ave.
District 8,	Wm. J. Gaffey,	Tremont St., Roxbury.
District 9,	Joseph H. Kenney,	Dudley St., Roxbury.
District 10,	Walter M. McLean,	Harvard St., Dorchester.
District 11,	Henry A. Fox,	Harvard Ave., Allston.
District 12,	Michael T. Mulligan,	Centre St., Jamaica Plain.
District 13,	Michael Kennedy,	Cor. Washington and Poplar sts., Roslindale.
District 14,	Maurice Heffernan,	Peabody Sq., Dorchester.
District 15,	Joseph A. Dolan,	Cor. Harvard Ave. and Win- throp St., Hyde Park.
Brookline,	Commissioner W. W. Estabrook,	340 Washington St.
	Chief Geo. H. Johnson,	340 Washington St.
Cambridge,	Chief James M. Casey,	Inman Sq.

HEADS OF FIRE DEPARTMENTS IN THE METROPOLITAN DISTRICT — Con.

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Chelsea,	Chief David M. Hudson,	307 Chestnut St.
Everett,	Chief Joseph T. Swan,	Broadway.
Lexington,	Chief Edward W. Taylor,	5 Main St.
Lynn,	Chief Edward E. Chase,	Cor. Baker and Franklin sts.
Malden,	Commissioner John H. Hannan,	Mountain Ave.
	Chief John T. Nicolls,	388 Main St.
Medford,	Chief Charles M. Bacon,	1 South St.
Melrose,	Chief Joseph Edwards,	576 Main St.
Milton,	Chief J. Harry Holmes,	Danton Ave.
Newton,	Chief W. B. Randlett,	27 Willow St.
Quincy,	Chief Faxon I. Billings,	Quincy Ave.
Reading,	Chief O. O. Ordway,	11 Pleasant St.
Revere,	Chief A. L. Kimball,	Broadway.
Rockland,	Chief Fred Chapman,	Union St.
Saugus,	Chief Ernest Stuart,	Woodbury Ave.
Somerville,	Chief Sewall M. Rich,	261 Medford St.
Stoneham,	Chief A. J. Smith,	1 Tidd St.
Waltham,	Chief Geo. L. Johnson,	Moody St.
Watertown,	Chief John W. O'Hearn,	99 Main St.
Winchester,	Chief David H. DeCourcy,	Mt. Vernon St.
Winthrop,	Chief F. W. F. Woolcott,	31 Pauline St.
Woburn,	Chief Frank E. Tracy,	Winn St.

BUILDING COMMISSIONERS AND INSPECTORS IN THE METROPOLITAN DISTRICT.

Arlington,	William Gratto.
Belmont,	James R. Logan.
Boston,	Commissioner Patrick O'Hearn.
Brookline,	Commissioner E. Lyon.
Cambridge,	Jeremiah Downey.
Chelsea,	James C. Denning.
Everett,	A. T. Macduff.
Lexington,	William Gratto.
Lynn,	Commissioner George A. Cornet.
Malden,	C. George W. Bagge.
Medford,	Frank B. Blodgett.
Melrose,	William S. Allen.
Milton,	G. E. Burt.

BUILDING COMMISSIONERS AND INSPECTORS IN THE METROPOLITAN
DISTRICT — Con.

Newton,	.	.	.	.	.	Commissioner Walter R. Forbush.
Quincy,	.	.	.	.	.	Warren S. Parker.
Reading,	.	.	.	.	.	Robert Parker.
Revere,	.	.	.	.	.	William H. Graham.
Rockland,	.	.	.	.	.	Fred Chapman.
Saugus,	.	.	.	.	.	Daniel Willis.
Somerville,	.	.	.	.	.	Commissioner Geo. L. Dudley.
Stoneham,	.	.	.	.	.	Albert Smith.
Waltham,	.	.	.	.	.	A. L. Cole.
Watertown,	.	.	.	.	.	William H. Benjamin.
Winchester,	.	.	.	.	.	Maurice Dineen.
Winthrop,	.	.	.	.	.	Charles F. Hargrave.
Woburn,	.	.	.	.	.	Henry Macksey.

FOURTH ANNUAL REPORT

OF THE

FIRE PREVENTION COMMISSIONER

FOR THE METROPOLITAN DISTRICT,

MASSACHUSETTS.

FROM AUGUST 1, 1917, TO AUGUST 1, 1918.



BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
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FIRE PREVENTION COMMISSIONER FOR THE METROPOLITAN DISTRICT.

FOURTH ANNUAL REPORT.

RESULTS OF FIRE PREVENTION DURING 1917.

During the year 1917 the fire prevention work was carried on along the same lines as in the past. A large number of inspections were made by the local fire departments, and in nearly every case bad conditions were corrected. Many orders for the removal of rubbish and other combustible waste material were issued and subsequently complied with. During the year 1917 the loss in Boston was larger than it has been since 1905, due to the fact that there were many more large fires where the losses exceeded \$10,000 each.

In 1915 there were 47 fires where the loss exceeded \$10,000 each, with a total loss of \$1,787,400; in 1916 there were 38 such fires with a total loss of \$1,363,600; and in 1917 there were 53 such fires with a total loss of \$3,117,300, an amount in excess of total fire loss in Boston in any year since 1913. These fires indicate that the losses occurred in buildings located in the congested value district, where sprinkler protection is necessary, and that only by the further installation of automatic sprinklers can these large losses be prevented.

FIRE PREVENTION.

[Aug.

Losses and Per Capita Losses in the Metropolitan District for 1914, 1915, 1916 and 1917.

	Loss for 1914.	Per Capita Loss for 1914.	Loss for 1915.	Per Capita Loss for 1915.	Loss for 1916.	Per Capita Loss for 1916.	Loss for 1917.	Per Capita Loss for 1917.
Arlington,	\$32,200	\$2 27	\$11,400	\$0 77	\$12,600	\$0 81	\$46,700	\$2 82
Belmont,	26,000	3 42	27,400	3 40	2,200	25	53,100	5 84
Boston,	3,044,600	4 16	3,003,200	4 03	2,473,000	3 25	4,056,400	5 23
Brookline,	45,600	1 41	21,000	1 63	6,700	19	23,600	66
Cambridge,	201,400	1 86	207,200	1 90	330,300	3 00	290,500	2 70
Chelsea,	153,400	3 73	132,500	3 05	134,500	3 39	87,300	1 83
Everett,	67,200	1 82	68,200	1 81	23,600	3 36	68,600	1 74
Lexington,	26,700	4 95	12,100	2 18	19,200	1 77	2,600	45
Lynn,	445,400	4 71	185,700	1 93	119,900	1 23	174,600	1 25
Malden,	89,300	1 86	219,700	4 49	47,700	96	63,600	1 25
Medford,	100,600	3 47	91,200	2 99	31,100	97	32,100	96
Melrose,	27,300	1 64	15,600	92	8,400	49	39,900	2 29
Milton,	29,800	3 51	20,300	2 36	6,600	76	6,600	74
Newton,	65,700	1 51	112,300	2 50	41,300	94	63,200	1 42
Quincy,	74,000	1 89	80,600	1 98	63,100	1 43	81,200	1 85
Reading,	4,900	85	10,900	1 60	56,100	7 20	16,900	1 82
Revere,	51,000	2 14	38,400	1 53	59,000	2 22	28,200	1 01
Rockland,	104,900	15 00	12,900	1 82	21,300	3 00	2,100	30
Saugus,	43,500	4 63	16,400	1 61	4,300	39	22,300	1 83
Stonerville,	225,800	2 66	72,600	84	112,000	1 26	112,500	1 24
Stoughton,	35,600	4 81	6,900	92	3,200	42	36,600	4 82
Waltham,	20,800	1 70	60,800	2 02	35,600	1 16	32,800	1 05
Watertown,	27,100	1 72	21,600	1 31	27,700	1 61	44,700	2 56
Winchester,	6,900	70	4,900	88	4,900	48	30,400	2 85
Winthrop,	17,100	1 40	30,700	2 41	76,300	5 73	13,200	96
Woburn,	96,900	5 97	311,500	18 90	168,500	10 10	54,300	3 21
Metropolitan District,	\$5,063,700	\$3 42	\$4,799,900	\$3 17	\$3,909,100	\$2 53	\$5,493,000	\$3 47
Massachusetts outside of Metropolitan District,	\$21,130,600	-	\$4,894,000	\$2 24	\$5,870,000	\$2 65	\$6,172,000	\$2 75
Metropolitan District outside of Boston,	\$2,019,100	\$2 70	\$1,797,000	\$2 35	\$1,436,100	\$1 83	\$1,436,600	\$1 78

As will be noted from the table the fire loss in the Metropolitan District, leaving out the city of Boston, has shown a constant decrease each year from \$2.70 per capita in 1914 to \$1.78 in 1917, whereas omitting the year 1914 on account of the large Salem fire, the per capita loss in Massachusetts outside of the Metropolitan District has shown a constant increase each year from \$2.24 in 1915 to \$2.75 in 1917. The fire loss in the Metropolitan Fire Prevention District in 1917 was approximately the same as in 1916, \$1,436,600, whereas the fire loss in Massachusetts outside the Metropolitan District in 1917 was \$6,172,000, and in 1916, \$5,870,000, or a loss in 1917 of \$302,000 greater than in 1916.

Total Alarms.

	1915.	1916.	1917.
Arlington,	107	96	125
Belmont,	53	42	53
Boston,	5,542	4,572	4,785
Brookline,	312	261	291
Cambridge,	709	696	699
Chelsea,	533	502	414
Everett,	291	243	286
Lexington,	140	77	93
Lynn,	1,061	915	1,016
Malden,	399	274	314
Medford,	422	260	325
Melrose,	203	119	179
Milton,	148	122	167
Newton,	747	460	542
Quincy,	493	221	378
Reading,	125	101	95
Revere,	302	264	270
Rockland,	44	44	37
Saugus,	105	87	109
Somerville,	633	476	410
Stoneham,	55	37	63
Waltham,	299	202	281
Watertown,	148	138	123
Winchester,	117	115	96
Winthrop,	155	90	118
Woburn,	172	154	167
Total,	13,315	10,568	11,436

Number of Fires causing Losses, excluding Alarms where no loss followed.

	1914.	1915.	1916.	1917.
Arlington,	35	23	18	33
Belmont,	9	13	10	15
Boston,	2,301	2,229	1,855	1,936
Brookline,	37	42	45	48
Cambridge,	264	262	226	225
Chelsea,	258	263	180	155
Everett,	61	64	44	46
Lexington,	10	14	8	3
Lynn,	319	242	193	210
Malden,	152	139	103	74
Medford,	63	57	52	67
Melrose,	40	25	19	33
Milton,	16	13	14	22
Newton,	110	113	87	94
Quincy,	84	85	44	48
Reading,	13	14	16	13
Revere,	68	66	59	92
Rockland,	14	10	11	8
Saugus,	25	29	14	19
Somerville,	109	122	109	104
Stoneham,	26	21	18	21
Waltham,	47	61	50	63
Watertown,	31	29	36	17
Winchester,	27	20	21	14
Winthrop,	25	33	18	24
Woburn,	25	36	38	28
Totals,	4,169	4,025	3,288	3,412

Although the number of alarms for 1917 was slightly larger than for 1916, owing to the dry spring, yet the number of alarms in 1917 was smaller by 1,879 than the number in 1915. From a comparison of the figures given in the table showing the fires causing losses, it is evident that there has been a large reduction in the number of such fires. In 1914 there were 4,169 such fires, and in 1917 there were 3,412, or a decrease of 757. In 1914, outside of the Metropolitan District, there were 4,260 such fires, and in 1917, 3,781, or a decrease of 479.

	1914.	1915.	1916.	1917.
Metropolitan District,	4,169	4,025	3,288	3,412
Massachusetts, outside Metropolitan District,	4,260	4,005	3,813	3,781

The reduction in the Metropolitan District for the three years preceding 1917 was a little over 18 per cent., while the reduction outside the Metropolitan District for the same period was a little over 11 per cent.

PREVENTION AND LIMITATIONS OF FIRES.

Since the last report of this department the work along fire-prevention lines has been greatly hampered because of war conditions. In the first place, it has been more difficult from day to day to obtain fire-fighting and fire-protection equipment. A short time ago the attention of the Commissioner was called to the fact that the can companies were not able to procure material for the production of safety cans, oily waste cans, ash cans, etc., but through his effort this condition has been relieved temporarily. In the second place, the expense of providing such equipment has increased to such an extent that it is difficult, and in certain cases impossible, to require changes on account of the limitations of the Commissioner's power to issue an order in excess of 5 per cent. of the assessed valuation of buildings and land.

During the past year 52 orders have been issued for automatic sprinklers in buildings, and under these orders 4 buildings have been equipped throughout, and 8 buildings partially protected. There are pending 18 orders for equipment throughout and 22 for partial equipment.

The cost of protecting buildings by automatic sprinklers has advanced to such an extent that sprinklers have been ordered only where such protection is absolutely necessary to protect the lives of the people living or working there, or the building and the neighborhood where it is located. Three years ago automatic sprinklers were installed at a cost as low as \$3 per head, whereas the cost of such equipment to-day in a similar building will be approximately \$15 per head. At the original cost of sprinkler protection, systems were installed and equip-

ment paid for in a few years by the saving in insurance on buildings and contents. But such is not the case to-day at the high cost of sprinkler protection.

FACTORY FIRES.

It is gratifying to note that the method adopted by the Commissioner for controlling factory fires is still producing results. As is clearly shown in the third annual report of the Commissioner the number of factory fires for the first five months of 1915 was 113, in 1916 for the same period, 63, and in 1917, 35. In 1918 the number of factory fires was 47. Although this is larger than 1917, yet it shows a general decrease over the first two years quoted.

CONTROL OF EXPLOSIVES IN 1918.

After the examination of explosive magazines throughout the Metropolitan District in 1917, it was found that the magazines were in such condition and in such location as to require a guard to be maintained over them constantly, and at the present time all magazines in the Metropolitan District containing explosives are protected by guards. The users of explosives have shown a fine spirit of co-operation, and no complaints indicating any hardships on the part of users of explosives have been received by the Commissioner.

The matter of maintaining guards over some of the magazines in the daytime has been considered by the Commissioner with a view to modifying the requirement. The Commissioner has decided that if a magazine is properly constructed and located, and provided with a proper mortised lock, so that it will be difficult to explode the magazine or to enter it for the purpose of stealing some of the contents, he will not require guards over the magazine in the daytime if the magazine is visited several times daily. The wisdom of the guard service is clearly shown by the fact that in the Metropolitan District there have been very few outrages with the use of explosives, and in cases where small amounts of explosives have been found, the indications are that the explosive has been brought into the Metropolitan District from some place without.

FIREWORKS.

This year it seemed proper for the Commissioner to prohibit the sale of fireworks of every description, having in mind the hazard to property and the opportunity furnished to persons of evil intent to cause explosions and fires. The city of Boston had less alarms than on any July 4 in its history, and no serious fires occurred in the Metropolitan District upon that day. That life also was conserved was shown by the absence of reports of deaths and injuries from fireworks this year. For the duration of the war, at least, fireworks will not be permitted to be sold in the Metropolitan District, except for special occasions under a special permit from the Commissioner.

WATER-FRONT CONDITIONS IN BOSTON.

Except the explosives which have been handled by the United States government, no explosives have been transported through the city of Boston for shipment abroad or shipped abroad from Boston. The nature of the water front is such that it would be dangerous at the present time to allow large shipments of explosives to be made from this port. Not only has the shipment of explosives been prohibited, but also shipment of drums of benzol and other inflammable fluids, except a small amount which was handled under the regulations of the Fire Prevention Commissioner and the direction of the Fire Commissioner of the city of Boston.

The delivery of gasoline and oils to fishing vessels, motor boats, etc., is still being made from vessels stationed in the harbor. There are at the present time three such vessels located under the direction of the harbor master, and a fourth one will be installed in a short time. Although this method of delivery is not as convenient as the fishermen and others desire, yet the number of accidents and the seriousness of the accidents indicate that the method is much preferable to the one used in 1914, which allowed delivery to be made by tank wagons, wooden barrels and steel drums over the combustible wharves and piers. The Commissioner now has under advisement the matter of deliveries to small supply boats, which are used to supply the vessels stationed in the harbor. As is noted in the

last report of the Commissioner, the present system is not very satisfactory. The accumulation of motor boats containing large quantities of gasoline and other oils at some of the combustible piers represents a hazard to the water front, and some method of reducing this hazard will have to be adopted.

PUBLIC GARAGES.

During this year a systematic examination has been made of all the public and business garages throughout the Metropolitan District, and changes have been made in them to make them comply with the present regulations of this department. The conditions of maintenance have been greatly improved, and fire protection devices, such as fire doors, extinguishers and sand pails, have been installed. Repair shops have been separated from the portions of the garage occupied for storage by proper fire walls, with openings protected by self or automatic closing fire doors. In many cases woodwork on the interior of the garages has been covered with either sheet metal or metal lath and cement plaster.

SMOKING IN WAREHOUSES.

At the request of the Public Safety Committee and the committee representing the warehouses working with the Public Safety Committee, the regulation prohibiting smoking in warehouses was established, and a copy of this regulation, which is given below, was mailed to all the warehouses in the Metropolitan District. It is to be hoped that there will be no warehouse fires in the future caused by careless smoking, or by the careless disposition of cigars, cigarettes or matches.

REGULATION GOVERNING SMOKING IN PUBLIC AND PRIVATE WAREHOUSES.

No person shall smoke or carry a lighted cigar, cigarette or pipe in a public or private warehouse situated in the Metropolitan Fire Prevention District of Massachusetts, and notices to that effect in letters $2\frac{1}{2}$ inches or more in height and with stroke $\frac{1}{2}$ inch or more shall be conspicuously posted at the entrance to and within the warehouse. These notices shall bear the words "By order of the Fire Prevention Commissioner" in letters $\frac{5}{8}$ inches in height and $\frac{1}{8}$ inch stroke, and the expression "Penalty for violation \$50." and shall read as follows:—

SMOKING PROHIBITED

By Order of the Fire Prevention Commissioner.

PENALTY FOR VIOLATION, \$50.

HAZARDS OUTSIDE THE CONTROL OF THE COMMISSIONER.

In the last annual report of the Commissioner attention was called to the fact that large losses occurred in buildings which were not under the control of this department, by reason of the fact that four or more persons do not live or are they usually employed therein above the second floor. This matter was also called to the attention of the Legislature and a bill introduced which would give the Commissioner jurisdiction over such buildings where four or more persons do not live or are usually employed above the second floor, such as wood-working establishments, storehouses, etc. The Commissioner should be given jurisdiction over such buildings in order that he may exercise control over hazardous conditions in them, even though it is not necessary to require the installation of sprinklers. Many conditions of maintenance are remedied by reason of the fact that the Commissioner can require sprinklers if the conditions of maintenance are not corrected.

From July 1, 1917, to Jan. 1, 1918, taking into account fires in the city of Boston where the loss is \$10,000 or more, a loss of \$420,000 occurred in buildings within the jurisdiction of the Commissioner; a loss of \$840,000 occurred in buildings not within his control, and in buildings where his authority is limited by the provision above stated, the loss in such fires amounted to \$740,000. These large losses represent a very large proportion of the entire losses in the city of Boston, and it seems most desirable to give the Commissioner authority to protect such buildings against fire.

FIRE PROTECTION IN STABLES FOR HORSES AND MULES.

In 1916 the following act was passed providing for better means of egress for horses and mules in stables: —

CHAPTER 158, GENERAL ACTS OF 1916.

AN ACT TO REQUIRE FIRE PROTECTION IN STABLES FOR HORSES AND MULES.

SECTION 1. No horse or mule shall be stabled on the second or any higher floor of any building unless there are two means of exit therefrom, at opposite ends of the building, to the main or street floor.

SECTION 2. This act shall not apply to stables equipped with an automatic sprinkler system.

SECTION 3. Any violation of this act shall be punished by a fine of not more than two hundred dollars.

SECTION 4. This act shall take effect on the first day of January in the year nineteen hundred and seventeen.

It will be noted that this act took effect Jan. 1, 1917. A list of all the stables which did not comply with this act was furnished the Fire Prevention Commissioner by the local heads of the Fire Departments previous to that time. There were 167 such stables in Boston and 46 in the Metropolitan District outside of Boston. Up to the present time in the city of Boston 5 such stables have been sprinklered, 121 provided with a second runway, 20 vacated to comply with the law, and there are 21 which are not in conformity with the law. Outside of Boston in the Metropolitan District 5 stables have been sprinklered, 20 provided with a second runway, 15 vacated to comply with the law, and there are 6 which are not in conformity with the law. Since the stable act went into effect fewer horses have been killed by fire, and there is no doubt but that the installation of sprinklers or better egress will protect the horses which have been stabled on the upper stories of buildings.

LEGISLATION RECOMMENDED.

1. Section 7 of the fire prevention statute gives the Commissioner jurisdiction over the storage, keeping or handling of any combustible article for other than domestic purposes, or of any article or material that may be dangerous to the public safety as a fire menace, provided it is stored, kept or handled in a building used for habitation or on that part of any lot within 50 feet of a building so used.

In view of the fact that combustible material, stored in a combustible building represents a far greater hazard than it would if stored on an open lot, it seems desirable that section 7 should be amended by inserting the words "or building or structure situated thereon" after the word "lot" in the second line, so as to read: "SECTION 7. No part of any building used for habitation, nor that part of any lot or building or

structure situated thereon within fifty feet of any building so used," etc.

2. Section 13 of the fire prevention statute provides that the Commissioner shall have power to make orders and rules relating to fires, fire protection and fire hazard binding throughout the Metropolitan District or any part of it, or binding upon any person or class of persons within said district, limited, however, to the following subjects, etc.

In order to violate this section it would be necessary to violate an order or rule made under this section. The Fire Prevention Commissioner has made regulations under this section on out-of-door fires, and in one or two cases of prosecution the defendant has been found guilty and the case placed on file in the lower court, the judge ruling that the penalty under section 27 of the said statute does not apply to violations of rules made under section 13. Section 27 should be amended by inserting after the word "act", in the second line, the words "or any rule or regulation made hereunder", so as to read: "SECTION 27. Except as is otherwise hereinbefore provided, any person violating any provision of this act, or any rule or regulation made hereunder, shall be guilty of a misdemeanor," etc.

3. Section 10 of the fire prevention statute should be amended by striking out after the word "Sprinklers", in the sixteenth line, the words "*provided, however,* that no such order shall apply to any building unless four or more persons live or are usually employed therein above the second floor."

4. Section 1 of chapter 370 of the Acts of 1904, as amended by various acts, should be amended by inserting after the word "inflammable", the word "gases", and after the word "compounds", the words "or other gases, fluids or compounds which may become dangerous to the public safety as a fire or explosion menace." This extended jurisdiction would give the Commissioner the power to make regulations controlling such gases as oxygen, hydrogen, acetylene, etc.; such liquids as acids, which are extremely dangerous to the lives of the firemen fighting fire; and such elements as sodium, potassium and phosphorus, which are exceedingly dangerous substances.


5. In section 4 of chapter 655 of the Acts of 1913 it will be noted that the determination of whether or not a building or structure is unsafe in case of fire is left with the superintendent of public buildings or such other officer as may be designated as "inspector of buildings." It will be noted further that this section applies only to cities and towns which have accepted the provisions of this section or the corresponding provision of earlier laws. There are in nearly every city and town in the Metropolitan District a number of old buildings of no value for occupancy which are in various stages of dilapidation, and which should be removed. The Fire Prevention Commissioner, whose duty it is to study fire, fire hazard and fire prevention and all matters relating thereto, has no jurisdiction over such buildings.

In view of the fact that these buildings are allowed to exist and are continually causing expense and trouble to the local fire departments, the Fire Prevention Commissioner should be given authority to order the removal or the repair of such buildings so that they cease to be a fire menace.

6. In very few of the cities and towns of the Metropolitan District are there regulations on the construction of chimneys, or the installation of heating plants. The Fire Prevention Commissioner should be given authority to make rules and regulations on the construction of chimneys and upon the installation of heating plants, in order to reduce the number of chimney fires by the installation of cleanouts, and the number of building fires from overheated chimneys and defective heating plants.


7. In order to better protect the congested value districts of the cities and towns, authority should be given the Fire Prevention Commissioner to designate the location of unpierced fire walls, to require the installation of fire windows constructed with metal or metal-covered sashes and frames with wired glass, and the installation of automatic sprinklers in such buildings as may be located at the boundaries of certain zones or districts, which could be determined by the Commissioner after consultation with the mayors and boards of selectmen and the heads of the fire departments of the cities and towns. This is a matter of extreme importance to all cities and towns, and more

especially to a city like Boston, where there has been no attempt to place barriers so that the extent of a conflagration might be anticipated.



The late Commissioner, Mr. John A. O'Keefe, passed away on Jan. 18, 1918, after a few months' illness.

Mr. O'Keefe was by training and experience a lawyer and educator, and under his guidance the fire prevention work in the Metropolitan District of Massachusetts progressed rapidly and successfully. His relations with the local officials were very cordial, and consequently he held their entire confidence. Mr. O'Keefe served more than three years, with close application to the work.



APPENDICES.

APPENDIX I.

CITIES AND TOWNS IN THE METROPOLITAN FIRE PREVENTION DISTRICT.

The following is a list of the cities and towns included in the Metropolitan Fire Prevention District, with the population according to the census of 1915:—

CITIES.	
Boston,	745,439
Cambridge,	108,822
Chelsea,	43,426
Everett,	37,718
Lynn,	95,803
Malden,	48,907
Medford,	30,509
Melrose,	16,880
Newton,	43,113
Quincy,	40,674
Revere,	25,178
Somerville,	86,854
Waltham,	30,154
Woburn,	16,410
	1,369,887
TOWNS.	
Arlington,	14,889
Belmont,	8,081
Brookline,	33,490
Lexington,	5,538
Milton,	8,600
Reading,	6,805
Rockland,	7,074
Saugus,	10,226
Stoneham,	7,489
Watertown,	16,515
Wilmington,	2,330
Winchester,	10,005
Winthrop,	12,758
	143,800
Total population,	1,513,687

APPENDIX II.

MEMBERS OF THE FIRE PREVENTION DEPARTMENT IN
THE METROPOLITAN DISTRICT.

FIRE PREVENTION DEPARTMENT FOR THE METROPOLITAN DISTRICT.

Commissioner, Frank Lewis.
 Deputy Commissioner, Michael A. Murphy.
 Secretary, Harry E. Lake.

HEADS OF FIRE DEPARTMENTS IN THE METROPOLITAN DISTRICT.

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Arlington,	Chief Walter H. Peirce,	1003 Massachusetts Ave.
Belmont,	Chief John F. Leonard,	Leonard St.
Boston,	Commissioner John Grady,	40 Bristol St.
	Chief Peter F. McDonough,	Mason St.
	Senior Deputy John O. Taber,	Fort Hill Sq.
	Junior Deputy Daniel F. Sennott,	Winslow and Dudley sts., Roxbury.
District 1,	Wm. E. Riley,	Paris St., East Boston.
District 2,	Allan J. Macdonald,	Main St., Charlestown.
District 3,	Stephen J. Ryder,	Pittsburgh St., South Bos- ton.
District 4,	Edward J. Shallow,	Bulfinch St.
District 5,	Albert J. Caulfield,	Mason St.
District 6,	Frank Jordan,	Dorchester St., South Bos- ton.
District 7,	Peter E. Walsh,	Warren Ave.
District 8,	Wm. J. Gaffey,	Tremont St., Roxbury.
District 9,	Joseph H. Kenney,	Dudley St., Roxbury.
District 10,	Walter M. McLean,	Harvard St., Dorchester.
District 11,	Henry A. Fox,	Harvard Ave., Allston.
District 12,	Michael T. Mulligan,	Centre St., Jamaica Plain.
District 13,	Michael Kennedy,	Cor. Washington and Poplar sts., Roslindale.
District 14,	Maurice Heffernan,	Peabody Sq., Dorchester.
District 15,	Joseph A. Dolan,	Cor. Harvard Ave. and Win- throp St., Hyde Park.
Brookline,	Commissioner W. W. Estabrook,	340 Washington St.
	Chief Geo. H. Johnson,	340 Washington St.
Cambridge,	Chief James M. Casey,	Inman Sq.

HEADS OF FIRE DEPARTMENTS IN THE METROPOLITAN DISTRICT — Con.

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Chelsea,	Chief David M. Hudson,	307 Chestnut St.
Everett,	Chief Joseph T. Swan,	Broadway.
Lexington,	Chief Edward W. Taylor,	5 Main St.
Lynn,	Chief Edward E. Chase,	Broad St.
Malden,	Commissioner John H. Hannan,	Mountain Ave.
	Chief John T. Nicolls,	388 Main St.
Medford,	Chief Charles M. Bacon,	1 South St.
Melrose,	Chief Joseph Edwards,	576 Main St.
Milton,	Chief J. Harry Holmes,	Danton Ave.
Newton,	Chief W. B. Randlett,	27 Willow St.
Quincy,	Chief Faxon Billings,	Quincy Ave.
Reading,	Chief O. O. Ordway,	11 Pleasant St.
Revere,	Chief A. L. Kimball,	Broadway.
Rockland,	Chief Fred Chapman,	Union St.
Saugus,	Chief Ernest Stuart,	Woodbury Ave.
Somerville,	Chief Sewall M. Rich,	261 Medford St.
Stoneham,	Chief A. J. Smith,	1 Tidd St.
Waltham,	Chief Geo. L. Johnson,	Moody St.
Watertown,	Chief John W. O'Hearn,	99 Main St.
Wilmington,	Chief Albert D. Butters,	Church St.
Winchester,	Chief David H. DeCourcy,	Mt. Vernon St.
Winthrop,	Chief J. B. Tewksbury,	31 Pauline St.
Woburn,	Chief Frank E. Tracy,	Winn St.

BUILDING COMMISSIONERS AND INSPECTORS IN THE METROPOLITAN DISTRICT.

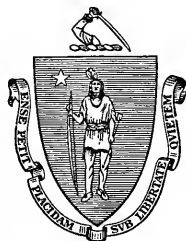
Arlington,	William Gratto.
Belmont,	James R. Logan.
Boston,	Commissioner Herbert A. Wilson.
Brookline,	Commissioner E. Lyon.
Cambridge,	Jeremiah Downey.
Chelsea,	James C. Denning.
Everett,	George H. Wood.
Lexington,	William Gratto.
Lynn,	Dennis J. Dinneen.
Malden,	C. George W. Bagge.
Medford,	Frank B. Blodgett.
Melrose,	William S. Allen.

BUILDING COMMISSIONERS AND INSPECTORS IN THE METROPOLITAN
DISTRICT — Con.

Milton,	G. E. Burt.
Newton,	Commissioner Walter R. Forbush.
Quincy,	Warren S. Parker.
Reading,	Robert Parker.
Revere,	William H. Graham.
Rockland,	E. J. Fitzgerald.
Saugus,	Daniel Willis.
Somerville,	Commissioner Geo. L. Dudley.
Stoneham,	Albert Smith.
Waltham,	A. L. Cole.
Watertown,	Wm. H. Wilson.
Wilmington,	Herbert C. Barrows.
Winchester,	Maurice Dineen.
Winthrop,	F. L. Hodges.
Woburn,	Henry Macksey.

FIFTH ANNUAL REPORT
OF THE
FIRE PREVENTION COMMISSIONER
FOR THE METROPOLITAN DISTRICT
MASSACHUSETTS

FROM AUGUST 1, 1918, TO AUGUST 1, 1919



BOSTON
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The Commonwealth of Massachusetts

TO HIS EXCELLENCY CALVIN COOLIDGE, *Governor of the Commonwealth of Massachusetts.*

SIR:—The Fire Prevention Commissioner for the Metropolitan District herewith submits his fifth annual report.

Very respectfully,

FRANK LEWIS,
*Fire Prevention Commissioner
for the Metropolitan District.*

AUG. 1, 1919.

FIRE PREVENTION COMMISSIONER FOR THE METROPOLITAN DISTRICT.

FIFTH ANNUAL REPORT.

RESULTS OF FIRE PREVENTION DURING 1918.

The general fire prevention work for the year has progressed along the lines which past experience has shown to be most effective. The results of the work are shown by the continued reduction in the number of fires with losses, the number of alarms, and the smaller comparative losses.

The accompanying tables show the reductions referred to above. In comparing the losses involved from year to year, it is necessary to consider the fluctuation of property values. The value of buildings as well as contents for the year 1918 was from 50 to 100 per cent. higher than in the preceding years. Since all losses are adjusted on the value at the time of the fire, fewer fires of lesser intensity will at the time of high prices produce as great or greater losses than the larger, more serious and more numerous fires would produce during normal prices.

In 1918 there were 44 fires in Boston where the loss exceeded \$10,000 each, with a total loss of \$1,976,000, as compared with 53 in 1917 with a loss of \$3,117,000, 38 in 1916 with a loss of \$1,364,000, and 47 in 1915 with a loss of \$1,787,000.

Although there was a decided increase in the number of alarms in the Metropolitan District in 1918 over 1916 and 1917, yet the number of fires where loss occurred was the smallest it has been for many years. By referring to the table, it will be

FIRE PREVENTION.

[Aug.

Losses and Per Capita Losses in the Metropolitan District for 1914, 1915, 1916, 1917 and 1918.

	Loss for 1914.	Per Capita Loss for 1914.	Loss for 1915.	Per Capita Loss for 1915.	Loss for 1916.	Per Capita Loss for 1916.	Loss for 1917.	Per Capita Loss for 1917.	Loss for 1918.	Per Capita Loss for 1918.
Arlington,	\$32,200	\$2 27	\$11,400	\$0 77	\$12,600	\$0 61	\$46,700	\$2 82	\$14,000	\$0 82
Belmont,	26,000	3 42	27,400	3 40	2,200	25	53,100	5 84	16,000	1 67
Boston,	3,044,600	4 16	3,003,200	4 03	2,473,300	3 25	4,056,400	5 23	2,827,300	3 58
Brookline,	45,600	1 41	21,000	1 90	6,700	19	23,600	66	31,500	85
Cambridge,	201,400	1 86	207,200	1 90	330,300	3 00	299,500	2 70	524,600	4 71
Chelsea,	153,400	3 73	132,500	3 05	154,500	3 39	87,300	1 83	148,700	2 97
Everett,	67,200	1 82	68,200	1 81	23,600	61	68,000	1 74	31,400	78
Lexington,	26,700	4 05	12,100	2 18	19,200	3 36	2,600	45	31,400	3 60
Lynn,	445,400	4 71	185,700	1 93	119,900	1 23	174,800	1 77	153,700	1 54
Malden,	89,300	1 86	219,700	4 49	47,700	96	63,600	1 25	35,000	68
Medford,	100,600	3 47	91,200	2 99	31,100	97	32,100	96	89,600	2 56
Melrose,	27,300	1 64	15,600	92	8,400	49	39,900	2 29	19,300	1 11
Milton,	29,800	3 51	20,300	2 36	6,600	76	6,600	74	6,400	71
Newton,	65,700	1 51	112,300	2 50	41,300	94	63,200	1 42	79,000	1 75
Quincy,	74,000	1 89	80,600	1 98	63,100	1 49	81,200	1 85	15,900	35
Reading,	4,900	85	10,900	1 60	56,100	7 20	16,900	1 92	6,400	65
Revere,	51,000	2 14	38,400	1 53	59,000	2 22	28,200	1 01	291,500	9 92
Rockland,	104,900	15 00	12,900	1 82	21,300	3 00	2,100	30	20,100	2 80
Saugus,	43,500	4 63	16,400	1 61	4,300	39	22,300	1 89	21,000	1 67
Somerville,	225,800	2 66	72,600	84	112,500	1 26	112,500	1 24	471,400	5 09
Stoneham,	35,600	4 81	6,900	92	3,200	42	36,600	4 82	13,600	1 77
Waltham,	20,800	70	60,800	2 02	35,600	1 16	32,800	1 05	38,700	1 23
Watertown,	27,100	1 72	21,600	1 31	27,700	1 61	44,700	2 56	27,300	1 46
Winchester,	6,900	88	8,800	88	4,900	48	30,400	2 95	12,100	1 16
Winthrop,	17,100	1 40	30,700	2 41	76,300	5 73	13,200	96	3,800	27
Woburn,	96,900	5 97	311,500	18 90	168,500	10 10	54,300	3 21	43,300	2 53
Metropolitan District,	\$5,063,700	\$3 42	\$4,799,900	\$3 17	\$3,909,100	\$2 53	\$5,493,000	\$3 47	\$4,963,400	\$3 05
Massachusetts outside of Metropolitan District,	\$21,130,600	-	\$4,894,000	\$2 24	\$5,870,000	\$2 65	\$6,172,000	\$2 75	\$7,025,000	\$3 18
Metropolitan District outside of Boston,	\$2,019,100	\$2 70	\$1,797,000	\$2 35	\$1,436,100	\$1 83	\$1,436,600	\$1 78	\$2,136,100	\$2 57

noted that the number of such fires has decreased gradually from 4,169, in 1914, to 3,099, in 1918, a very remarkable and significant result. Outside the Metropolitan District there was a reduction from 4,260, in 1914, to 3,715, in 1918, a reduction of 12.8 per cent as compared with 25.7 per cent in the Metropolitan District.

Aside from the large increases in loss due to big fires in Cambridge and Somerville, the losses in the Metropolitan District compare favorably with the reduced losses of recent years.

Total Alarms.

	1915.	1916.	1917.	1918.
Arlington,	107	96	125	187
Belmont,	53	42	53	90
Boston,	5,542	4,572	4,785	5,174
Brookline,	312	261	291	350
Cambridge,	709	696	699	712
Chelsea,	533	502	414	455
Everett,	291	243	286	347
Lexington,	140	77	93	126
Lynn,	1,061	915	1,016	1,022
Malden,	399	274	314	327
Medford,	422	260	325	391
Melrose,	203	119	179	200
Milton,	148	122	167	187
Newton,	747	460	542	725
Quincy,	493	221	378	498
Reading,	125	101	95	89
Revere,	302	264	270	366
Rockland,	44	44	37	86
Saugus,	105	87	109	123
Somerville,	633	476	410	674
Stoneham,	55	37	63	76
Waltham,	299	202	281	325
Watertown,	148	138	123	202
Winchester,	117	115	96	119
Winthrop,	155	90	118	120
Woburn,	172	154	167	209
Total,	13,315	10,568	11,436	13,180

Number of Fires causing Losses, excluding Alarms where no Loss followed.

	1914.	1915.	1916.	1917.	1918.
Arlington,	35	23	18	33	29
Belmont,	9	13	10	15	16
Boston,	2,301	2,229	1,855	1,936	1,760
Brookline,	37	42	45	48	41
Cambridge,	264	262	226	225	169
Chelsea,	258	263	180	155	159
Everett,	61	64	44	46	55
Lexington,	10	14	8	3	12
Lynn,	319	242	193	210	171
Malden,	152	139	103	74	60
Medford,	63	57	52	67	64
Melrose,	40	25	19	33	26
Milton,	16	13	14	22	16
Newton,	110	113	87	94	91
Quincy,	84	85	44	48	50
Reading,	13	14	16	13	11
Revere,	68	66	59	92	81
Rockland,	14	10	11	8	18
Saugus,	25	29	14	19	30
Somerville,	109	122	109	104	90
Stoneham,	26	21	18	21	11
Waltham,	47	61	50	63	56
Watertown,	31	29	36	17	24
Winchester,	27	20	21	14	12
Winthrop,	25	33	18	24	22
Woburn,	25	36	38	28	25
Totals, Metropolitan District.	4,169	4,025	3,288	3,412	3,099
Totals, Massachusetts outside of Metropolitan District.	4,260	4,005	3,813	3,781	3,715

Even with these increases the per capita loss for the Metropolitan District was not as great as in 1914, 1915 or 1917, while outside the Metropolitan District the per capita loss was larger than any of the four years shown in the table. The general trend of the losses is evident from an examination of the per capita losses for each city and town for the past five years.

PREVENTION AND LIMITATIONS OF FIRES.

For over a year the work of the Fire Prevention Commissioner has been seriously hampered by the great increase in the cost of materials and equipment. At such high prices, only the minimum requirements can be considered, thus lowering the general character of the structures. Changes in existing buildings which represent very definite fire hazards can be obtained only in a few instances because of the limitations of the Commissioner's powers to order changes involving more than 5 per cent of the assessed valuation or to exercise any jurisdiction whatsoever by reason of the particular kind of occupancy.

During the past year 30 orders were issued for automatic sprinklers in buildings, with a result that 8 buildings have been equipped throughout and 4 buildings partially protected. There are pending 13 orders for complete and 5 orders for partial systems.

CONTROL OF EXPLOSIVES IN 1918.

The handling and use of explosives during the past year have been without accident, and the storage under guards has prevented the theft of them for illegal purposes. This spring the guard service has been discontinued for some of the better type magazines where suitable locks have been provided. The same care has been exercised by the local officials and the explosive dealers to see that explosives were delivered for legitimate purposes only.

FIREWORKS.

As there seemed to be the general belief among the local authorities that such fireworks and firecrackers as are permitted by law and the regulations should be allowed to be discharged this year on the 17th of June and the 4th of July, the war restrictions were removed. Although there were a number of small fires and accidents, some of which were fatal, yet the results were comparable with the safe and sane Fourths of recent years. Authority is specifically given each city and town to prohibit by ordinance or by-law the sale and use of fireworks and firecrackers, but no such ordinance or by-law has been adopted.

WATER-FRONT CONDITIONS IN BOSTON.

No explosives which are not under the control of the United States government are allowed to be transported through the city of Boston nor stored within the city unless for use therein. Inflammable fluids are used pretty generally by the boats and vessels in the harbor and about the docks without regulation, except that deliveries are made to them only from authorized stations, which are isolated.

A license was issued recently for the installation of an approved supply station, to be located on the breakwater near the fish pier. Such a station will greatly reduce the hazard from that of the supply boats anchored in the vicinity, as the storage will be buried underground on the shore.

GARAGES.

This summer, after four years' trial, the regulations on garages adopted in 1915 have been revised to make them consistent with modern construction and the new methods of conducting the business. They are now in a simplified form and represent minimum requirements consistent with the safety of the adjoining property.

Most of the existing garages which represented serious fire and even conflagration hazards have been properly safeguarded, and it is expected that all such garages will be in reasonably good condition by the end of this year.

ENGINEERING DIVISION.

Last fall the necessity of approving plans and layouts for public garages, dry cleansing establishments, fuel oil installations, oil storage plants and many allied industries was so urgent that an engineer was engaged with the approval of the Governor and Council, and since that time this work has been so important and so great that a second engineer has been employed a large part of the time to handle the special problems which are continually arising.

This department has proved to be one of great service since it provides for the approval once and for all of each proposition,

thus saving much time and expense from alterations which would otherwise have to be made after a plant had been completed.

The department was very fortunate in obtaining the services of Mr. Carl Stuetzel, Jr., formerly supervisor of plans with the Boston Building Department, as an engineer. Mr. Stuetzel has done very efficient work for the department since his engagement last fall.

In October last Mr. Harry E. Lake, who had devoted his entire time and energy as secretary and engineer to the department from the time of its organization in 1914, resigned in order to be of greater assistance to the government during the war, and became associated with the National Board of Fire Underwriters by whom he was assigned to the Bureau of Yards and Docks, Navy Department, Washington, D. C., as an advisory engineer on fire protection. Since Mr. Lake completed his duties at Washington he has been engaged on special engineering work for the department.

To fill the position of secretary made vacant by Mr. Lake's resignation, Mr. Everett W. Shumway was appointed Oct. 7, 1918.

SMOKING IN WAREHOUSES.

Since the adoption of the regulation on smoking in warehouses, no fire from this cause has been reported in such a building. Although this was a war measure, yet, up to the present time, no request has been received to discontinue the regulation.

HAZARDS OUTSIDE THE CONTROL OF THE COMMISSIONER.

In the last annual report, certain perfecting amendments to the fire prevention statute were recommended, but negative action was taken by the Legislature. It is to be hoped that the coming year will see these extremely important amendments adopted in order that the Commissioner may exercise the authority anticipated by the fire prevention statute.

From Jan. 1, 1918, to Jan. 1, 1919, taking into account fires in the city of Boston where the loss was \$10,000 or more, a loss of \$380,000 occurred in buildings within the jurisdiction of the Commissioner; a loss of \$1,300,000 occurred in buildings

not within his control; and in buildings where his authority is limited by the provision that four or more persons must live or be employed above the second floor, the loss in such fires amounted to \$820,000.

LEGISLATION RECOMMENDED.

Below is given a copy of Senate Bill No. 154 of 1919, which should be enacted the coming year. The necessity of such perfecting amendments is stated on pages 16-19 of the fourth annual report of this department.

AN ACT RELATIVE TO THE BETTER PREVENTION OF FIRES THROUGHOUT THE METROPOLITAN DISTRICT.

Be it enacted, etc., as follows:

SECTION 1. Section seven of chapter seven hundred and ninety-five of the acts of nineteen hundred and fourteen is hereby amended by inserting the words:— or buildings or structures thereon,— after the word “lot”, in the second line,— so as to read as follows:— *Section 7.* No part of any building used for habitation, nor that part of any lot or buildings or structures thereon within fifty feet of any building so used, shall be used for the storage, keeping or handling of any combustible article for other than domestic purposes, or of any article or material that may be dangerous to the public safety as a fire menace, unless a permit has first been obtained therefor from the commissioner. No part of any such building shall be used as a carpenter’s shop nor for the storage, keeping or handling of feed, hay, straw, excelsior, shavings, sawdust, cotton, paper stock, feathers, or rags, except under such terms and conditions as the commissioner may prescribe.

SECTION 2. Section twenty-seven of chapter seven hundred and ninety-five of the acts of nineteen hundred and fourteen is hereby amended by inserting after the word “act”, in the second line, the words:— or any rules or regulations made hereunder,— so as to read as follows:— *Section 27.*— Except as is otherwise hereinbefore provided, any person violating any provision of this act, or any rules or regulations made hereunder, shall be guilty of a misdemeanor and liable to a fine of fifty dollars for each offence, or, in case of a continuing offence after a notice of such violation, to a fine not exceeding ten dollars for every day during which the violation continues.

SECTION 3. Section ten of chapter seven hundred and ninety-five of the acts of nineteen hundred and fourteen is hereby amended by striking out after the word “or”, in the third line, the words “for the business of”, and inserting in place thereof the words:— “tailoring, or any such building within which persons are engaged in”,— and by striking out after the

word "sprinklers", in the sixteenth line, the words "that no such order shall apply to any building unless four or more persons live or are usually employed therein above the second floor", — so as to read as follows: — *Section 10.* Any building within the metropolitan district used in whole or in part for the purpose of woodworking or tailoring, or any such building within which persons are engaged in manufacturing or working upon wooden, basket, rattan, or cane goods or articles, or tow, shavings, excelsior, oakum, rope, twine, string, thread, bagging, paper, paper stock, cardboard, rags, cotton or linen garments or goods, or rubber, feathers, paint, grease, soap, oil, varnish, petroleum, gasoline, kerosene, benzine, naphtha, or other inflammable fluids, and any buildings in the metropolitan district used in whole or in part for the business of keeping or storing any of such goods or articles, except in such small quantities as are usual for domestic use, or for use in connection with and as incident to some business other than such keeping or storing, shall, upon the order of the commissioner, be equipped with automatic sprinklers.

SECTION 4. Section one of chapter two hundred and eighty of the acts of nineteen hundred and five, as amended, is hereby further amended by inserting after the word "inflammable", in the eleventh line, the words: — gases or, — and by inserting after the word "compounds", in the twelfth line, the words: — or other gases, fluids, or compounds, which may become dangerous to the public safety as a fire or explosion menace, — so as to read as follows: — *Section 1.* The powers and duties heretofore conferred and imposed upon cities and towns and the mayors and aldermen, city councils and selectmen thereof, by chapter one hundred and two of the Revised Laws, to regulate the keeping, storage, use, manufacture, sale, handling, transportation or other disposition of gunpowder, dynamite, crude petroleum or any of its products, or explosive or inflammable gases, or fluids or compounds, or other gases, fluids or compounds, which may become dangerous to the public safety as a fire or explosion menace; tablets, torpedoes, or any explosives of a like nature, or any other explosives, except fireworks and fire crackers, are hereby conferred and imposed upon the detective and fire inspection department of the district police, except as to the transportation of said explosives by steam railroads.

SECTION 5. The fire prevention commissioner for the metropolitan district, immediately upon being informed by report or otherwise that a building or other structure or anything attached or connected therewith in any city or town is specially unsafe in case of fire, may inspect the same; and if it appears to him to be specially unsafe in case of fire, he shall first in writing notify the owner or agent or any person having an interest therein to remove it or make it safe in case of fire. The fire prevention commissioner for the metropolitan district may affix in a conspicuous place upon the exterior walls of the building a notice of its unsafe condition, which notice shall not be removed or defaced without authority from him. Whoever is so notified shall be allowed until twelve o'clock

noon on the day following the service of the notice in which to begin the work of making such building safe in case of fire or of removing such structure, and he shall employ sufficient labor speedily to make it safe or remove it; and such owner or interested person shall for every day's continuance of refusal or neglect to make said building safe or to remove the same, after being so notified, forfeit to the city or town in which the structure is located not less than ten dollars nor more than fifty dollars.

SECTION 6. Section thirteen of chapter seven hundred and ninety-five of the acts of the year nineteen hundred and fourteen is hereby amended by inserting after the letter "H", in the thirty-third line, the words:— Regulating the method of construction of chimneys, the installation of heating plants, and,— and by adding after the forty-seventh line the following new paragraphs:— N. Requiring the installation of automatic sprinklers in such buildings as may be located at the boundaries of fire zones or districts, which said boundaries shall be determined by the commissioner after consultation with the mayors and the heads of fire departments of cities and boards of selectmen and the heads of fire departments of towns. O. Designating the location of unpierced fire walls. P. Requiring the installation of fire windows, constructed with metal or metal covered sashes and frames with wired glass,— so as to read as follows:— *Section 13.* In addition to the powers given by sections one to twelve, inclusive, the commissioner shall have power to make orders and rules relating to fires, fire protection and fire hazard binding throughout the metropolitan district, or any part of it, or binding upon any person or class of persons within said district, limited, however, to the following subjects:—

A. Requiring the keeping of portable fire extinguishers, buckets of water or other portable fire extinguishing devices on any premises by the occupant thereof, and prescribing the number and situation of such devices.

B. Prohibiting or regulating the accumulation, and requiring the removal, of combustible rubbish, including waste paper, cardboard, string, packing material, sawdust, shavings, sticks, rags, waste leather and rubber, boxes, barrels, broken furniture and other similar light or combustible refuse.

C. Prohibiting or regulating the setting or burning of fires out of doors.

D. Causing obstacles that may interfere with the means of exit to be removed from floors, halls, stairways and fire escapes.

E. Ordering the remedying of any condition found to exist in or about any building or other premises, or any ship or vessel in violation of any law, ordinance, by-law, rule or order in respect to fires and the prevention of fire.

F. Causing any vessel moored to or anchored near any dock or pier to be removed and secured in some designated place: *provided*, that such vessel is on fire or in danger of catching fire, or is by reason of its condition or the nature of its cargo a menace to shipping or other property.

G. Requiring and regulating fire drills in theatres, public places of amusement, and public and private schools.

H. Regulating the method of construction of chimneys, the installation of heating plants, and requiring the cleaning of chimney flues and vent pipes.

I. Requiring proper safeguards to be placed and maintained about or over roof skylights.

J. Prohibiting or regulating smoking in factories, workshops and mercantile establishments.

K. Requiring that all signs and advertising devices erected on buildings shall be approved by said commissioner.

L. Causing to be made public all violations of fire prevention laws by posting placards on buildings or premises, and by publishing in the daily newspapers the names of the owners and specifying the buildings in which the violation occurs.

M. Defining the classes of buildings to be equipped with sprinkler protection under the authority of this act.

N. Requiring the installment of automatic sprinklers in such buildings as may be located at the boundaries of fire zones or districts, which said boundaries shall be determined by the commissioner after consultation with the mayors and the heads of fire departments of cities and boards of selectmen and the heads of fire departments of towns.

O. Designating the location of unpierced fire walls.

P. Requiring the installation of fire windows, constructed with metal or metal covered sashes and frames with wired glass.

SECTION 7. Section twenty-two of chapter seven hundred and ninety-five of the acts of nineteen hundred and fourteen is hereby amended by striking out the words "in such cases", in the seventh and eighth lines, and inserting in place thereof the words:— in all cases where such rules or orders require the making of additions to or changes in the premises themselves, such as would immediately become real estate and be the property of the owner of the premises, — so as to read as follows:— *Section 22.* In any case where buildings or other premises are owned by one person and occupied by another under lease or otherwise, the orders of the commissioner shall apply to the occupant alone, except where such rules or orders require the making of additions to or changes in the premises themselves, such as would immediately become real estate and be the property of the owner of the premises. In all cases where such rules or orders require the making of additions to or changes in the premises themselves, such as would immediately become real estate and be the property of the owner of the premises, the rules or orders shall affect the owner and not the occupant, and, unless it is otherwise agreed between the owner and the occupant, the occupant whose use of the premises has caused the making of such additions or changes, in addition to his rent or other payments shall, after the addition or changes are made, pay a reasonable per cent. of the cost thereof annually to the owner of the prem-

ises. No rule or order shall be made or enforced which requires an expenditure by the owner or occupant of more than five per cent of the last annual assessed valuation of the land and buildings to which such rule or order relates.

Since the consolidation of the department, to take effect December 1 next, will place the administration of nearly all the powers conferred by chapter 795 of the Acts of 1914 under one State department for the entire State, the other provisions of of the act should be extended to apply also throughout the State.

FIRE PREVENTION DAY.

October 9, the anniversary of the Chicago fire of Oct. 9, 1871, has come to be pretty generally observed throughout the country as Fire Prevention Day, but last year, because of the activities of the United States government, November 2 was the day fixed.

For the past three years a day has been set aside in Massachusetts, by proclamation of the Governor, for the purpose of thinking and talking fire prevention. The preparations and results of last year's observance were much more extensive than in previous years.

On the eve of Fire Prevention Day the annual test of the water curtains on the Filene Building, Washington Street, Boston, was made, and following the successful test a banquet was given the fire chiefs of the Metropolitan District and representatives of insurance and allied associations, after which a parade, consisting of the fire chiefs and representatives, fire apparatus, marching clubs and Boy Scouts, assisted by bands and cadet musicians of the parochial schools, was escorted to the National Theatre, where addresses and appropriate films emphasized the significance of fire and accident prevention.

On the afternoon of Fire Prevention Day an impressive and instructive demonstration of fire apparatus was given at Post Office Square by the Boston Fire Department.

It was rather unfortunate, so far as the school work was concerned, that Saturday should have been chosen for the day of observance, but exercises, consisting of talks and demonstra-

tions by members of the fire departments, were held in most of the schools of the Metropolitan District on Friday, November 1.

As in the past, notices were sent to factory managers requesting them to investigate the means of egress and fire hazards in their factories and to remedy any dangerous conditions found to exist. A large number of factory fire cards were distributed throughout the Metropolitan District.

FUTURE OF FIRE PREVENTION.

Even with the strenuous opposition to the enforcement of the fire prevention statutes, the work has progressed, and progressed rapidly. Such enforcement has created many hardships on property owners, especially those who had control of the poorer class of property rented for hazardous businesses where the need for fire prevention was greatest.

Much discretion has been shown in the administration of the law in order to prevent the abandonment or liquidation of property which would in many cases have taken away the income from persons dependent upon it or forced the immediate sale at great loss.

Nevertheless much has been accomplished in the five years' trial, which is summarized, in brief, below, as this year will be the last of the fire prevention work under a separate department devoted to the cause and this the last annual report of the Fire Prevention Commissioner. Chapter 350 of the General Acts of 1919, known as "An Act to organize in departments the executive and administrative functions of the Commonwealth," provides that the fire prevention work shall be carried on by a State Fire Marshal, who will be a director under the control of the Commissioner of Public Safety.

Such a consolidation should give an equitable administration of the laws and a more uniform code should result. Certainly fire prevention is an extremely necessary public function, and the results should be manifested in the improved welfare and happiness of the people. The results already obtained would be more generally realized if it were not for the unrest that permeates the whole world, concealing progress and emphasizing the unavoidable evils of good government.

FIVE YEARS OF FIRE PREVENTION IN MASSACHUSETTS, UNDER
CHAPTER 795 OF THE ACTS OF 1914.

After several years of agitation on the part of public-spirited citizens, the department of the Fire Prevention Commissioner was organized in the fall of 1914. With little co-operation and severe criticism, the department started on a progressive growth, which it has maintained throughout its existence. The results, which could be plainly foreseen by the promoters, were so unapparent during the early stages that the accomplishments have been attained only by constant application on the part of the untiring officials and employees of the department. It is with great pleasure and gratitude that I record the following results of five years of fire prevention in this State.

In 1914 the Metropolitan Fire Prevention Department consisted of twenty-two cities and towns about and including Boston. Since then six towns have accepted the provisions of the act.

From the outset it was evident that the work must be carried on in two divisions, viz., educational and constructional, the former being the more important.

Educational Work.

The educational work has been by far the most effective but unfortunately the less evident. It has been conducted along the following lines: —

1. Addresses.
2. Conferences.
3. Publicity: newspapers and circulars.
4. Schools.
5. Special meetings.

Many addresses have been delivered before labor unions, civic and religious societies, lodges, clubs, business meetings, schools and like assemblies, and much information has been spread through such addresses.

Many conferences have been held with representatives of the various trades interested in the particular subject under consideration. The results of such conferences can be appreciated from the following example.

When the garage regulations were prepared, and before they were adopted, a conference was held with representatives of the garage owners at which their suggestions were noted and modifications of the regulations made to meet the valid objections. Afterwards conferences with the fire chiefs and building inspectors were held and the regulations modified to meet the local conditions. It is evident that regulations made in this manner must necessarily be practicable, and that they were is shown by the fact that they were in effect over four years without amendments, except of a very minor character. The same can be said of all regulations adopted by the department.

Through the medium of the newspapers, which have always been public spirited and anxious to spread educational information, and that of circulars and booklets, mailed, posted and distributed by the school children, cautions have been so emphasized that the impressions will last for years to come.

Many circulars and pamphlets have been distributed among the school children as well as teachers, and from time to time special exercises have been held in the schools along fire prevention lines. Much credit is due the superintendents of schools and members of the fire departments for their efforts in teaching fire prevention. From time to time fire drills have been held by representatives of the department, and to meet the requirements systematic drills have been established in nearly all the schools by the principals in charge.

Besides the general conferences, there have been special meetings, such as that held on Fire Prevention Day last year, which have helped to keep up the interest in the subject. As the result of one special meeting, the general conditions and fire protection in all schoolhouses throughout the district have been greatly improved; of another, the ordinances prohibiting the use of the wooden shingles, because of the flying firebrand hazard, were adopted in nearly half of the cities and towns of the district.

Constructional Work.

At the outset it was imperative that regulations should be adopted at once governing the important industries in which serious fires would probably occur, in order that the local officials, through whom the work of the Fire Prevention Commis-

sioner must be conducted, might be guided in the exercise of their delegated powers.

Regulations were established as follows:—

Out-of-door fires,	Nov. 15, 1914
Delivery of gasoline to boats and vessels,	Jan. 1, 1915
Revised,	March 31, 1916
Signs and advertising devices,	Feb. 17, 1915
Motion-picture films,	March 5, 1915
Revised,	Jan. 15, 1916
Volatile inflammable fluids and garages,	April 1, 1915
Revised,	July 22, 1915
Minor amendment, garages,	April 17, 1916
Minor amendment, garages,	Aug. 30, 1916
Definition of fire limits in Revere,	Aug. 1, 1917
Revised, garages,	June 1, 1919
Fireworks,	June 4, 1915
Paints and oils,	Nov. 15, 1915
Explosives,	May 15, 1916

Approval of Plans and Construction.

Since the establishment of the regulations it was found that there was not the uniformity of application that was expected, and therefore it was necessary to establish an engineering department. This department now passes on all garages with a capacity exceeding four automobiles, outside of Boston; oil storage and fuel oil systems; dry cleansing and dyeing plants; acetylene gas and oxygen plants; motion-picture film exchanges; and, in fact, all factories, warehouses and buildings or structures wherein large quantities of inflammable fluids or compounds are manufactured, stored, kept or used.

Besides the regular propositions coming before the engineering department, there are many special cases on which decisions are given. This department not only passes on the plans, but also approves the work. The question of strength of materials is left with the local building departments.

Removal or Protection of Hazardous Occupancies.

Many hazardous industries were forced to relocate away from congested value districts, so that many conflagration areas have been eliminated. Other such industries have been required to

relocate in better types of buildings or protect their plants with automatic sprinklers.

In the city of Boston there have been 163 buildings equipped throughout and 101 partially equipped with automatic sprinklers upon order of the Commissioner, and there are now pending 45 orders for complete equipments and 21 for partial systems. The total number of buildings in Boston which are protected by systems of automatic sprinklers approved by the Boston Board of Fire Underwriters is 883, of which 264 have been so protected through the efforts of this department.

Between Jan. 1, 1915, and Jan. 1, 1919, there were in the city of Boston 182 fires where the loss exceeded \$10,000 each, with a total loss of \$8,244,000, as compared with a total of 7,780 fires, with a total loss of \$12,359,000, that is, $2\frac{1}{3}$ per cent. of the fires represented about 67 per cent. of the loss. Between Jan. 1, 1916, and Jan. 1, 1919, the loss from such fires was \$6,457,000. Of this loss, only \$1,550,000 occurred in buildings in which the Commissioner had sprinkler jurisdiction; \$4,570,000 occurred in buildings where he had no jurisdiction by reason of the nature of occupancy, and \$3,370,000 occurred in buildings where there were not four or more persons living or usually employed above the second floor

Portable Extinguishers.

Many orders have been issued to provide portable extinguishers in buildings where protection from such equipment would be of value. For the protection of many hazardous businesses such equipment is required by the regulations.

Maintenance.

The accumulation and disposal of rubbish represent the greatest problem in fire prevention. Not only is there lack of care on the part of the owners of buildings in making proper arrangements for the disposal of such material, but there is also lacking the individual responsibility on the part of tenants and employees to use the available equipment in a proper manner, if at all.

An inspection may reveal the existence of materials subject to spontaneous combustion in large quantity in a cellar near a

vertical combustible shaft, so that a fire would mushroom out on each floor of the building. The janitor, if there is one, is told to remove the same. An order is issued on the owner to have the rubbish removed. After three or four days the rubbish is removed and the order complied with. Another inspection is made a week after the first one and the conditions are as bad or worse than before.

In order to overcome the evils of the present system, there should be a fine established for not properly disposing of waste material, which fine would result in the establishment for each building, of a definite plan for the removal of rubbish. Nearly all cities and towns have regular collection days for rubbish, so that all successful plans, if the public collection is to be depended upon, will have to be based on such a schedule. All refuse should be collected at least once a day, oftener if necessary, and placed in proper metal covered containers, baled and the bales stored in a fireproof room, or removed to a safe place outside the building. At night the premises should be left clean and free from all such material unless it is so kept that it cannot cause or increase a fire.

Paint Stores or Shops located in or near Dwellings.

Under section 6 of the fire prevention statute, regulations were adopted on paint stores and paint shops, and all such premises reported by the local officials have been provided with proper fireproof rooms in which to keep the paints and oils which are in bulk.

Salamanders.

Section 9 of the statute provides for the safe use of salamanders. After several prosecutions, the number of fires from such a cause has been very materially reduced.

Egress.

Although provisions for egress from buildings are well taken care of by the local officials, yet many cases of blocked or faulty stairways or fire escapes have been corrected by this department.

Fire drills have been established in most theatres and public

schools and in a majority of private schools. Many fire drills have been called for by members of the department and bad practices eliminated, so that the drills to-day are well standardized.

Fire Protection in Stables for Horses and Mules.

Since the passage of chapter 158, General Acts of 1916, most of the stables where horses and mules were kept above the first floor have been provided with second runway, protected with automatic sprinklers, or abandoned for such use above the first floor.

Of a total of 218 such stables reported by the local officials, 210 are now in compliance with the above-mentioned statute. The loss of life of horses and mules from fire during the past two years was very small and much less than in previous years.

Chimney Flues and Vent Pipes.

Although no authority is given the Commissioner over structural features of chimneys, yet many chimneys have been repaired after causing small fires. The chimneys as constructed to-day do not afford any practical means of determining their condition. All chimneys should be provided with a cleanout at the bottom.

The removal of soot from chimneys and vent pipes is very important, but there are not the facilities at present to see that they are properly attended to. Many chimney fires occur each year, and in all cases the chimneys are cleaned after the fire or required immediately to be cleaned. The examination of chimneys and vent pipes which have no cleanouts by the inspectors is not practicable.

Smoking in Factories, Workshops and Mercantile Establishments.

The question of prohibiting smoking in factories, workshops and mercantile establishments was taken up before representatives of such establishments and before representatives of the labor unions and it was the unanimous opinion that a general prohibition would be the cause of more serious fires than the

general practice of smoking, because employees would smoke in unfrequented places where a fire would gain considerable headway before being detected.

There are, of course, certain businesses where smoking or the use of matches, sparks or open flames would be dangerous, and in such occupancies smoking is prohibited by regulation.

As smoking has become a general habit among all classes of people, the most plausible means of preventing fires from such a cause in an unprotected building having inflammable contents appears to be the setting aside of a suitable room for the purpose; such a room might also be used as a locker and rest room.

Signs and Advertising Devices on Buildings.

Although all new signs and advertising devices on buildings are erected under regulation of this department, yet there has been no attempt to make all existing signs structurally safe. Many signs exist to-day on the roofs of buildings in all stages of deterioration, and occasionally a sign is precipitated by a strong wind to the street because of the failure of the wooden supports. A general periodic inspection should be made of all signs and advertising devices on buildings in order to require them to be kept in proper condition.

Statistics.

From the beginning records of fires have been kept in accordance with sections 19 and 20 of the fire prevention statute. Because of the number of fires and the congested values in Boston, the reports are received from the fire department without values, except the estimated losses, while, outside of Boston, the reports are made with complete figures. The figures for the Boston reports are obtained as far as possible from reports from the insurance companies and the losses finally checked with the figures of the Boston Protective Department, to which department is due full credit for all published statistics on Boston fire losses. The reports for the cities and towns outside of Boston are all checked with the insurance reports and corrected when necessary.

These corrected reports are all on file in the office in card index form as well as the insurance reports. Most of the insurance reports are made by the Actuarial Bureau of the National Board of Fire Underwriters from reports received by that bureau from the adjusters. The companies which do not report to the Actuarial Bureau are supposed to report directly to the department, but complete reports are not received because of the number of foreign and other companies with headquarters outside of the State from which the difficulties of obtaining the reports is very great.

The Actuarial Bureau is doing excellent work in collecting statistics on fire losses, and the reports from the bureau have been very satisfactory.

From the reports a card index is kept of the owners of property and occupants on whose premises fires occur, so that the number of fires and losses of an owner or occupant are available.

All statistics quoted in the annual reports of the department have been taken from the reports of the District Police in order that the comparisons would be made on the same basis. There are numerous losses which are adjusted by the insurance companies which are not reported to the District Police and of which no record is made in their reports either as to number of fires or as to losses. In comparing the causes of fires, all fires should be considered, so that the statistics will fairly represent the conditions as they exist. Although the loss involved in such fires does not represent a large per cent of the total loss, yet the number of fires would have a big influence on the causes, unless it could be assumed that the same ratio exists between the causes of such fires and those for which the statistics are now given, which undoubtedly would not be the case. In 1918 there were reported in Boston 1,585 such fires, representing a total loss of \$83,000. The total number of fires not including this type of fires in Boston for 1918 was 1,760, and the total loss exclusive of that for such fires was \$2,830,000, so that there were not recorded in 1918 47 per cent of the number of fires with loss and $3\frac{1}{2}$ per cent of the loss due to such fires.

The tabulations given in Appendices IV and V have been made from published records, and are extremely interesting and instructive. They show averages taken over a period of years, for both the occupancies and the causes of fires. The percentages and average per fire indicate in general how effective fire prevention should be conducted.

Statistics are of great value if properly interpreted and misleading unless thoroughly understood. The utmost care should be used in quoting from tables.

Administration.

It was recognized from the beginning that the fire prevention work must be administered fairly to all without regard to political or friendly influence, and that has been the continued policy of the department. All decisions have been rendered free from prejudice and influence and according to the best judgment of the Commissioner, taking into consideration all the facts in the case.

Sections 4 and 19 of the fire prevention statute place a great deal of responsibility and work upon the local departments, without providing a means of performing such duty. All of the fire departments are limited to the minimum number of men, who are required to be at their stations ready for alarms, and, therefore, the investigations must be done by the officers of the departments, who are already overtaxed with duties and responsibilities. For five years the Commissioner has endeavored to obtain through the Legislature permission to employ inspectors or investigators to work in co-operation with the local officials, but such authority has been denied with the suggestion that the present system should be given a fair trial. Certainly a fair trial has been given, and it is the opinion of the local officials as well as of the Commissioner that for the Metropolitan District there should be at least six men trained in particular branches of the work in order to satisfactorily and efficiently carry out the functions of the department.

The local officials, and especially the members of the fire and building departments, have performed willingly and with great credit to themselves the additional duties required of them by the Commissioner. Without their assistance the department

would have been of very little value to the people. However, without the department of fire prevention there would not be the co-operation between the local departments nor the uniformity of administration and enforcement of the law that now exists.

There can be little doubt but that the Department of Public Safety, which will succeed in the exercise of the powers and obligations of the department, will be better equipped and will receive better support from the public, so that even greater results can be expected within the next few years along fire prevention lines.

APPENDICES.

APPENDIX I.

CITIES AND TOWNS IN THE METROPOLITAN FIRE PREVENTION DISTRICT.

The following is a list of the cities and towns included in the Metropolitan Fire Prevention District, with the population according to the census of 1915:—

<i>Cities.</i>	
Boston,	745,439
Cambridge,	108,822
Chelsea,	43,426
Everett,	37,718
Lynn,	95,803
Malden,	48,907
Medford,	30,509
Melrose,	16,880
Newton,	43,113
Quincy,	40,674
Revere,	25,178
Somerville,	86,854
Waltham,	30,154
Woburn,	16,410
	1,369,887
<i>Towns.</i>	
Arlington,	14,889
Belmont,	8,081
Brookline,	33,490
Lexington,	5,538
Milton,	8,600
Reading,	6,805
Rockland,	7,074
Saugus,	10,226
Stoneham,	7,489
Watertown,	16,515
Williamstown,	3,981
Wilmington,	2,330
Winchester,	10,005
Winthrop,	12,758
	147,781
Total population,	1,517,668

APPENDIX II.

MEMBERS OF THE FIRE PREVENTION DEPARTMENT IN THE METROPOLITAN DISTRICT.

Fire Prevention Department for the Metropolitan District.

Commissioner,	Frank Lewis.
Deputy Commissioner,	Michael A. Murphy.
Secretary,	Everett W. Shumway.

Heads of Fire Departments in the Metropolitan District.

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Arlington,	Chief Walter H. Peirce,	1003 Massachusetts Ave.
Belmont,	Chief John F. Leonard,	Leonard St.
Boston,	Commissioner John R. Murphy,	40 Bristol St.
	Chief Peter E. Walsh,	Mason St.
	Deputy Chief of 1st Division John O. Taber.	Fort Hill Sq.
	Deputy Chief of 2d Division Daniel F. Sennott.	Winslow and Dudley sts., Roxbury.
	Deputy Chief of 3d Division Henry A. Fox.	Warren Ave.
District 1,	F. A. Sweeney,	Paris St., East Boston.
District 2,	Wm. E. Riley,	Main St., Charlestown.
District 3,	Capt. J. J. Kane (Acting),	Pittsburgh St., South Boston.
District 4,	Edw. J. Shallow,	Bulfinch St.
District 5,	Albert J. Caulfield,	Mason St.
District 6,	Francis J. Jordan,	Dorchester St., South Boston.
District 7,	Capt. J. J. Lally (Acting),	Warren Ave.
District 8,	Wm. J. Gaffey,	Tremont St., Roxbury.
District 9,	Joseph H. Kenney,	Dudley St., Roxbury.
District 10,	Walter M. McLean,	Harvard St., Dorchester.
District 11,	Capt. G. H. Nichols (Acting),	Harvard Ave., Allston.
District 12,	Michael T. Mulligan,	Centre St., Jamaica Plain.
District 13,	Michael J. Kennedy,	Cor. Washington and Poplar sts., Roslindale.
District 14,	A. J. McDonald,	Peabody Sq., Dorchester.
District 15,	Joseph A. Dolan,	Cor. Harvard Ave. and Winthrop St., Hyde Park.

Heads of Fire Departments in the Metropolitan District — Concluded.

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Brookline, . . .	Commissioner W. W. Estabrook, .	340 Washington St.
	Chief George H. Johnson, . .	340 Washington St.
Cambridge, . . .	Chief James M. Casey, . . .	Inman Sq.
Chelsea,	Chief David M. Hudson, . . .	307 Chestnut St.
Everett,	Chief Joseph T. Swan, . . .	Broadway.
Lexington, . . .	Chief Edward W. Taylor, . . .	5 Main St.
Lynn,	Chief Edward E. Chase, . . .	Broad St.
Malden,	Commissioner John H. Hannan, .	Mountain Ave.
	Chief John T. Nicholls, . . .	388 Main St.
Medford,	Chief Thomas A. Qualey, . . .	1 South St.
Melrose,	Chief Joseph Edwards, . . .	576 Main St.
Milton,	Chief J. Harry Holmes, . . .	Danton Ave.
Newton,	Chief W. B. Randlett, . . .	27 Willow St.
Quincy,	Chief Alfred L. Meade, . . .	Quincy Ave.
Reading,	Chief O. O. Ordway,	11 Pleasant St.
Revere,	Chief A. L. Kimball,	Broadway.
Rockland,	Chief Fred Chapman,	Union St.
Saugus,	Chief George W. Atkinson, . . .	Woodbury Ave.
Somerville, . . .	Chief Sewall M. Rich,	261 Medford St.
Stoneham,	Chief A. J. Smith,	1 Tidd St.
Waltham,	Chief George L. Johnson, . . .	Moody St.
Watertown, . . .	Chief John W. O'Hearn, . . .	99 Main St.
Williamstown, . .	Chief A. Remillard,	Waters St.
Wilmington, . . .	Chief E. L. Day,	Church St.
Winchester, . . .	Chief David H. DeCourcy, . . .	Mt. Vernon St.
Winthrop,	Chief J. B. Tewksbury, . . .	31 Pauline.St.
Woburn,	Chief Frank E. Tracy,	Winn St.

APPENDIX III.

BUILDING COMMISSIONERS AND INSPECTORS IN THE METROPOLITAN DISTRICT.

Arlington,	William Gratto.
Belmont,	James R. Logan.
Boston,	Commissioner Herbert A. Wilson.
Brookline,	Commissioner E. Lyon.
Cambridge,	Jeremiah Downey.
Chelsea,	James C. Denning.
Everett,	George H. Wood.
Lexington,	William Gratto.
Lynn,	Dennis J. Dinneen.
Malden,	C. George W. Bagge.
Medford,	Frank B. Blodgett.
Melrose,	William S. Allen.
Milton,	G. E. Burt.
Newton,	Commissioner Walter R. Forbush.
Quincy,	Warren S. Parker.
Reading,	George Sidebottom.
Revere,	William H. Graham.
Somerville,	Commissioner George L. Dudley.
Stoneham,	Albert L. Smith.
Waltham,	Arthur L. Cole.
Watertown,	William H. Wilson.
Winchester,	Maurice Dineen.
Winthrop,	F. L. Hodges.
Woburn,	Henry Macksey.

APPENDIX IV.

NUMBER OF FIRES FOR YEARS 1909 TO 1918, INCLUSIVE, MASSACHUSETTS (NOT INCLUDING BOSTON) AND BOSTON.

[Statistics on fires compiled from the reports of the Massachusetts District Police. "S." signifies State, exclusive of Boston; "B." signifies Boston.]

CAUSE.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	Total.	Average.	Per Cent.
Boiling over of fat, tar, varnish, etc.,	S. 31	33	33	56	38	51	53	37	49	34	415	41	.58
Burning soot,	B. 12	21	18	17	21	25	16	17	14	11	172	17	.24
Careless fumigation,	S. 84	46	60	68	64	102	92	57	53	47	673	67	.95
Careless smoking,	B. 19	7	12	16	22	26	25	17	22	17	183	18	.26
Careless use of matches,	S. 2	5	5	7	2	6	6	2	3	2	40	4	.06
Children and matches,	B. 1	—	—	—	2	3	2	—	1	1	12	1	.02
Defective chimneys,	S. 339	350	374	469	532	661	687	573	556	577	5,118	512	7.22
Defective construction,	B. 159	174	229	231	212	259	278	217	295	270	2,324	232	3.28
Defective heating apparatus,	S. 264	247	312	363	416	419	437	449	432	388	3,757	376	5.28
Electrical,	B. 401	383	443	468	455	477	390	282	272	267	3,838	384	5.40
Escaping gas ignited,	S. 312	340	372	325	422	363	427	326	336	367	3,590	359	5.05
Explosion of lamp, lantern, or stove,	B. 131	148	168	223	197	180	160	129	123	135	1,584	158	2.23
Firecrackers,	S. 257	275	258	250	256	384	330	320	330	309	2,978	298	4.19
	B. 54	47	54	61	34	53	50	39	29	53	474	47	.67
	S. 3	6	5	3	5	3	6	27	7	4	69	7	.10
	B. 1	1	1	—	—	1	4	19	9	1	19	2	.03
	S. 35	47	40	85	49	42	74	70	51	43	536	54	.75
	B. 15	10	6	14	14	10	21	7	19	28	144	14	.20
	S. 53	48	66	60	88	164	146	144	155	190	1,114	111	1.57
	B. 32	27	23	38	42	52	40	53	75	51	433	43	.61
	S. 25	22	31	35	41	29	29	26	38	20	296	30	.42
	B. 38	17	4	12	11	13	12	11	8	3	129	13	.18
	S. 132	111	130	98	61	101	76	82	79	69	939	94	1.32
	B. 71	49	35	51	28	24	23	27	31	27	366	37	.51
	S. —	—	32	52	88	18	15	—	11	4	220	22	.31
	B. —	—	19	21	40	15	8	13	14	5	135	13	.19

NUMBER OF FIRES FOR YEARS 1909 TO 1918, INCLUSIVE, MASSACHUSETTS (NOT INCLUDING BOSTON) AND BOSTON
— Concluded.

CAUSE.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	Total.	Average.	Per Cent.
Fireworks,	86	71	42	45	36	28	11	23	26	31	399	40	.56
Foreign substances in stock,	45	26	14	12	2	8	29	1	5	—	116	12	.16
Friction,	1	3	—	—	3	51	29	29	23	22	343	34	.48
Gasoline or volatile oils, ignition of,	2	31	19	43	44	37	23	73	—	—	14	1	.02
Hot ashes in wooden receptacles,	87	104	119	171	176	204	169	156	165	46	424	42	.60
Incendiary,	37	29	36	70	68	72	71	74	12	9	66	7	.09
Lamp, lantern or stove taking fire, upset or broken,	71	91	94	104	94	144	105	138	101	111	1,504	150	2.12
Lighting fire with kerosene or gasoline,	34	24	44	39	38	33	47	33	40	35	591	59	.83
Lightning,	135	111	102	126	137	126	146	134	110	65	1,053	105	1.48
Malicious mischief,	16	9	8	20	3	17	29	21	16	12	367	37	.52
Material ignited by gas jet, lamp, stove, etc.,	221	162	206	203	196	185	173	96	200	217	1,859	186	2.62
Mechanics' torches,	77	55	65	60	45	49	70	52	43	38	554	55	.78
Miscellaneous,	3	3	2	3	4	1	41	5	1	5	68	7	.10
Overheated cooking or heating apparatus,	1	2	—	—	2	—	—	2	3	1	11	1	.02
Rats and matches,	42	63	156	78	110	66	9	80	143	104	851	85	1.20
Sparks from bonfires, brush or forest,	4	1	1	5	10	3	—	3	13	9	49	5	.07
	37	30	41	60	41	65	54	27	41	52	448	45	.63
	22	10	34	37	11	35	25	15	9	21	219	22	.31
	241	281	272	311	298	366	388	373	289	239	3,057	306	4.30
	174	171	181	206	180	188	152	133	127	121	1,633	163	2.29
	22	11	13	8	35	32	30	12	15	15	198	20	.28
	5	8	4	15	10	5	8	—	20	11	75	7	.11
	38	24	65	68	88	119	127	64	74	106	773	77	1.09
	13	11	23	24	28	40	30	29	25	24	247	25	.35
	198	216	232	271	249	364	295	328	345	340	2,833	283	3.90
	68	71	77	90	77	101	111	92	131	106	875	87	1.23
	126	137	149	150	145	195	107	81	77	58	1,230	123	1.73
	78	81	80	111	83	63	49	44	33	26	706	71	.99
	67	72	115	60	52	83	144	38	88	156	855	85	1.20
	6	13	17	6	11	7	23	3	13	10	109	11	.15

Sparks from chimney,	S.	204	182	224	268	204	239	262	235	219	241	2,278	228	3.20
Sparks from firebox in boiler room,	B.	37	38	66	74	59	54	66	54	55	38	541	54	.76
Sparks from forges, heaters, fireplaces, etc.,	B.	23	18	15	9	4	18	9	10	10	8	129	13	.18
Sparks from locomotives,	B.	4	5	—	—	—	1	—	3	8	1	26	3	.04
Sparks from matches,	B.	108	101	123	93	109	117	101	125	94	89	1,060	106	1.49
Spontaneous combustion,	B.	43	23	30	46	26	31	25	39	32	36	341	34	.48
Thawing water pipes,	B.	95	38	85	64	85	57	70	43	53	65	675	67	.95
Tramps,	B.	17	11	9	18	8	12	9	7	9	14	114	11	.16
Unknown,	B.	96	100	144	111	87	131	104	102	83	65	1,023	102	1.44
Separate totals,	S.	4,231	4,221	4,746	5,055	5,149	6,128	5,801	5,246	5,237	5,054	50,888	5,089	71.60
Grand total,	B.	1,868	1,708	2,008	2,375	2,096	2,301	2,229	1,855	1,936	1,760	20,136	2,014	28.40
Exposure,		6,099	5,929	6,754	7,430	7,245	8,429	8,030	7,101	7,193	6,814	71,024	7,102	100.00
		435	405	408	558	686	2,666	531	495	354	453	6,991	—	—

APPENDIX V.

AVERAGE FOR YEARS 1907 TO 1918, INCLUSIVE, MASSACHUSETTS (NOT INCLUDING BOSTON) AND BOSTON.

[Statistics on fires compiled from the reports of the Massachusetts District Police. "S" signifies State, exclusive of Boston; "B" signifies Boston.]

OCCUPANCY.	TOTAL.		AVERAGE PER YEAR.		PER CENT.		AVERAGE PER FIRE.		Total Fires (Number).	Average Fires (Number).
	Buildings.	Contents.	Buildings.	Contents.	Buildings.	Contents.	Buildings.	Contents.		
Automobiles,	\$246,500	\$148,100	\$20,500	\$12,300	.38	.22	\$280	\$170	885	74
Bakeries,	15,200	103,000	1,300	8,600	.02	.16	40	240	425	35
Banks,	264,100	157,400	22,000	13,100	.40	.24	750	440	354	30
Barber shops,	43,800	48,600	3,600	4,000	.07	.07	390	430	112	9
Barns and stables,	107,300	81,600	8,900	6,800	.16	.12	1,140	870	94	8
Blacksmiths,	16,500	38,400	1,400	3,200	.02	.06	310	710	54	4
Board and lodging,	79,100	53,300	6,600	4,400	.12	.08	350	230	228	19
Bridges, docks and wharves,	40,700	32,100	3,400	2,700	.06	.05	250	190	165	14
Buildings under construction and unoccupied,	4,470,900	2,440,800	372,600	203,400	6.84	3.68	1,100	600	4,052	338
Candy manufacturing,	482,500	435,200	40,200	36,300	.74	.66	950	860	507	42
Carpenter shops,	58,100	45,300	4,800	3,800	.09	.07	230	180	251	21
Churches,	51,600	36,900	4,300	3,100	.08	.06	690	490	75	6
	292,200	99,000	24,300	8,200	.44	.15	450	150	646	54
	143,800	95,800	12,000	8,000	.22	.14	150	100	969	81
	109,400	2,500	9,100	200	.16	-	3,040	70	36	3
	55,700	2,300	4,600	200	.08	-	1,240	50	45	4
	266,400	17,700	22,200	1,500	.41	.03	1,090	70	244	20
	203,300	21,200	16,900	1,800	.31	.03	2,480	260	82	7
	89,700	127,800	7,500	10,600	.14	.19	700	990	129	11
	62,400	123,300	5,200	7,300	.09	.19	1,140	2,240	55	5
	49,700	42,200	4,100	3,500	.07	.06	590	500	84	7
	35,600	36,200	3,000	3,000	.05	.05	450	460	79	7
	1,467,500	252,300	122,300	21,000	2.25	.38	6,190	1,070	237	20
	240,300	49,100	20,000	4,100	.37	.07	3,390	690	71	6

Cigars and tobacco,	S.	33,100	85,400	2,800	7,100	.05	.13	370	950	90	7
Clothing and furnishings,	S.	19,100	38,100	1,600	3,200	.03	.03	240	480	80	7
Clubs and lodges,	B.	275,500	896,900	23,000	74,700	.42	1.35	970	3,160	284	24
Coal and wood yards,	B.	78,300	346,100	6,500	28,800	.12	.52	580	2,550	136	11
Cotton mills,	B.	660,800	281,500	55,000	23,500	1.01	.43	1,780	760	371	31
Drug stores,	B.	267,800	59,800	22,300	5,000	.41	.09	1,770	397	151	13
Dry cleansing and dyeing,	S.	220,000	110,600	18,300	9,200	.33	.17	1,720	860	128	11
Factories, unclassified,	B.	170,400	67,200	14,200	5,600	.26	.10	3,710	1,460	46	77
Foundries,	S.	453,700	644,900	37,800	53,700	.69	.97	490	700	926	7
Gas houses,	B.	1,700	15,300	100	1,300	—	.02	240	220	7	1
Greenhouses,	S.	142,100	285,300	11,800	23,800	.22	.43	690	1,390	205	17
Halls,	B.	40,100	104,400	3,300	8,700	.11	.16	370	980	107	9
Hardware,	B.	72,300	136,800	6,000	11,400	.11	.21	1,230	2,320	59	5
Henneries,	B.	33,000	45,400	2,700	3,800	.05	.07	1,500	2,060	22	2
Hospitals,	S.	511,200	1,414,400	42,600	117,900	.78	2.13	1,480	3,960	337	30
Hotels,	S.	17,832,600	12,909,900	1,490,200	1,075,800	27.35	19.49	540	390	32,971	19
Gas houses,	B.	2,905,200	1,472,400	242,100	122,700	4.44	2.22	220	110	13,170	1,097
Greenhouses,	B.	4,171,600	5,337,500	347,600	446,500	6.38	8.09	2,510	3,230	1,661	138
Halls,	S.	1,066,000	2,660,700	88,800	221,700	1.63	4.01	1,670	4,170	638	53
Hardware,	B.	224,200	196,300	18,700	16,400	.34	.30	1,170	1,020	192	16
Henneries,	S.	147,900	310,400	12,300	25,900	.23	.47	1,970	4,130	75	6
Hospitals,	B.	90,000	98,700	7,500	8,200	.14	.15	370	410	242	20
Hotels,	B.	42,100	39,400	3,500	3,200	.06	.06	380	310	129	11
Gas houses,	B.	315,200	480,700	26,300	40,100	.48	.73	1,910	2,920	165	14
Greenhouses,	B.	44,200	179,800	3,700	15,000	.07	.27	530	2,140	84	7
Halls,	B.	373,700	823,000	31,100	68,600	.57	1.24	560	1,240	663	55
Hardware,	S.	286,100	1,006,300	23,800	83,900	.44	1.52	1,820	6,410	157	13
Henneries,	B.	56,800	31,500	4,700	2,600	.09	.05	1,830	1,020	31	3
Hospitals,	B.	200	200	—	—	—	—	200	200	1	—
Hotels,	B.	36,900	21,700	3,100	1,800	.06	.03	530	310	69	6
Gas houses,	B.	4,300	2,000	400	200	.01	—	350	170	12	1
Greenhouses,	B.	438,200	683,500	36,500	57,000	.67	1.03	480	670	1,017	85
Halls,	S.	212,200	504,600	17,500	42,000	.32	.76	320	750	672	56
Hardware,	B.	206,500	107,200	8,900	8,900	.32	.16	2,110	1,090	98	8
Henneries,	B.	275,900	28,100	23,000	2,300	.42	.04	9,510	970	29	2
Hospitals,	S.	115,800	230,800	9,600	19,200	.18	.35	1,520	3,040	76	6
Hotels,	B.	163,400	613,600	13,600	51,100	.25	.93	2,370	8,900	69	6
Gas houses,	B.	44,800	19,500	3,700	1,600	.07	.03	160	70	273	23
Halls,	B.	3,100	3,900	300	300	.01	.01	100	70	41	3
Hardware,	B.	4,000	3,100	3,500	1,600	.06	.03	680	310	61	3
Henneries,	S.	42,300	2,300	1,200	1,200	.02	—	420	70	34	5
Hospitals,	B.	1,527,200	515,900	127,300	43,000	2.34	.78	3,300	1,110	463	39
Hotels,	B.	301,000	160,700	25,100	13,400	.46	.24	1,370	730	220	18

Pool, billiards, bowling,	S.	91,300	86,500	7,600	7,200	.14	.13	700	660	130	11
Printing,	B.	41,000	28,800	3,400	2,400	.06	.04	950	670	43	4
Private schools and academies,	B.	202,400	532,100	16,900	44,300	.31	.80	1,760	4,630	115	10
Public buildings,	B.	127,700	360,800	10,600	30,100	.19	.54	1,120	3,170	114	8
Public schools,	B.	1,174,100	248,100	97,800	20,700	1.80	.37	12,100	2,560	97	3
Railroads,	B.	115,900	8,100	9,700	700	.18	.01	3,310	2,310	35	21
Restaurants,	B.	1,397,800	344,800	116,500	28,700	2.14	.52	5,500	1,360	254	6
Sheds and outbuildings,	B.	122,300	22,200	10,200	1,800	.19	.03	1,680	300	73	7
Shoe factories,	B.	366,100	46,800	30,500	3,900	.56	.07	4,310	550	85	1
Shoe stores,	B.	4,900	600	400	—	.01	—	350	40	14	36
Storehouses,	B.	530,500	968,500	44,200	79,900	.81	1.45	1,220	2,200	435	11
Stores and dwellings,	B.	776,300	1,153,700	64,700	96,100	1.19	1.74	6,090	8,950	129	36
Stores, unclassified,	B.	251,900	21,000	21,000	12,500	.38	.23	590	350	427	36
Summer cottages,	B.	227,000	235,900	18,900	19,700	.35	.36	530	550	327	89
Tailor shops,	B.	246,100	165,000	20,500	13,700	.38	.25	230	150	1,072	31
Theaters,	B.	91,600	86,900	7,600	7,200	.14	.13	240	280	374	32
Unclassified,	B.	614,200	1,351,500	51,200	112,600	.94	2.04	1,580	3,480	388	21
Woodworking with power,	B.	55,600	4,600	4,600	15,300	.08	.28	1,630	5,390	34	3
Woolen mills,	B.	153,800	363,400	12,800	30,300	.23	.55	620	1,430	254	14
Vessels,	B.	107,800	440,500	9,000	36,700	.16	.66	1,000	2,550	173	95
Separate total,	B.	1,141,700	2,559,400	95,100	213,300	1.75	3.87	1,930	3,600	554	46
Grand total,	B.	516,600	1,993,400	43,000	166,100	.79	3.01	970	640	677	56
	B.	657,400	430,100	54,800	35,800	1.01	.65	770	680	167	14
	B.	128,900	113,100	10,700	9,400	.20	.17	970	1,390	158	129
	B.	1,500,300	2,142,900	125,000	178,600	2.30	3.24	1,050	2,460	739	62
	B.	777,800	64,800	64,800	152,000	1.19	2.75	1,740	570	387	32
	B.	672,400	221,000	56,000	18,000	1.03	.83	—	—	—	—
	B.	—	—	—	—	—	—	—	—	—	—
	B.	126,700	183,100	10,600	15,300	.19	.28	360	510	356	30
	B.	285,100	367,300	23,800	30,600	.44	.55	980	1,260	291	24
	B.	438,000	123,700	36,500	10,300	.67	.19	3,920	1,100	112	9
	B.	112,000	22,400	9,300	1,900	.17	.03	5,600	1,140	20	2
	B.	1,127,000	734,700	93,900	61,200	1.72	1.11	1,240	810	905	75
	B.	329,000	497,400	27,400	47,900	.75	.15	480	740	673	56
	B.	770,500	694,700	64,200	51,900	1.18	1.05	2,780	2,510	277	23
	B.	128,000	163,400	10,700	13,600	.20	.25	1,540	1,970	83	7
	B.	498,700	344,100	41,600	28,700	.76	.52	3,000	2,070	166	14
	B.	43,500	296,500	3,600	24,700	.07	.45	8,700	59,300	5	—
	B.	97,000	64,800	8,100	5,400	.15	.10	1,200	800	81	7
	B.	267,100	187,000	22,300	15,600	.41	.28	3,520	2,460	76	6
Separate total,	S.	\$51,833,600	\$45,566,500	\$4,319,500	\$3,797,200	—	—	\$880	\$770	58,804	4,900
Grand total,	B.	13,572,900	20,690,500	1,131,100	1,724,200	—	—	560	860	24,019	2,002
		\$65,406,500	\$66,257,000	\$5,450,600	\$5,521,400	100.00	100.00	\$790	\$890	\$2,823	6,902

